

**Quarterly Operation, Maintenance,
and Monitoring Report for the
Groundwater Interim Remedial
Measure**

September 2013

Operable Unit 3 (Former Grumman Settling Ponds)
Bethpage, New York

NYSDEC ID # 1-30-003A

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NYSDEC ID# 1-30-003A

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- B Compliance and Performance Program and Water Sample Analytical Results
- C Vapor Sample Analytical Results
- D Air Discharge Quality Evaluation



**Quarterly Operation,
Maintenance, and
Monitoring Report
Groundwater Interim
Remedial Measure**

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1. Introduction

Pursuant to the Administrative Order on Consent (AOC) Index # W1-0018-04-01 (NYSDEC 2005), ARCADIS of New York, Inc. (ARCADIS), on behalf of Northrop Grumman Systems Corporation (Northrop Grumman), has prepared this Operable Unit 3 (OU3) Groundwater Interim Remedial Measure (Groundwater IRM) Quarterly Operation, Maintenance, and Monitoring (OM&M) Report for submittal to the New York State Department of Environmental Conservation (NYSDEC). The present day Bethpage Community Park property (Park) and the Former Grumman Plant 24 Access Road, which the NYSDEC has collectively termed the "Former Grumman Settling Ponds Area" and designated as OU3, are referred to herein as the Site Area. A Site Area Location map is provided as Figure 1.

The Groundwater IRM has been operational since July 21, 2009. This quarterly OM&M report summarizes the Groundwater IRM OM&M activities performed between July 1 and September 30, 2013 (hereinafter referred to as the reporting period). During this reporting period, the Remedial System and Environmental Effectiveness Monitoring Programs were conducted in accordance with the NYSDEC-approved OU3 Interim Groundwater IRM OM&M Manual (OM&M Manual) (ARCADIS 2009) and the remedial well maintenance program described in the 2011 Annual Report (ARCADIS 2012).

As discussed in the OU3 Site Area Remedial Investigation Report (Site Area RI) (ARCADIS 2011), Northrop Grumman does not take responsibility for certain compounds (e.g. Freon 12 and Freon 22), which are present in Site Area groundwater. Throughout this report, a distinction is made between the "Project" and "Non-project" Volatile Organic Compounds (VOCs), which are defined as follows:

- "Project VOCs:" are VOCs that may be related to former Grumman historical activities. For this report, Project VOCs are the VOCs listed in the Interim State Pollutant Elimination Discharge System (SPDES) permit equivalency (NYSDEC 2009), plus Toluene, Benzene, and Total Xylenes. A list of "Project VOCs" is provided in various tables throughout this report.
- "Non-project VOCs:" are VOCs, such as Freon 12 and Freon 22 that are unrelated to former Grumman activities but have been detected in the Site Area groundwater. As noted in the Site Area RI (ARCADIS 2011), a sub-plume of Freon 22 has been identified originating from the area of the Town of Oyster Bay's (Town's) former ice rink (shown on Figure 2). Based on Town information (Zervos,

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Theodore 2007), Freon 22 was used by the Town and released to the environment.

2. Groundwater Interim Remedial Measure Objectives

The remedial action objectives (RAOs) for the Groundwater IRM are as follows:

- Mitigate the off-site migration of project-related, dissolved-phase VOCs. Specifically, the Groundwater IRM addresses:
 - Groundwater that has total volatile organic compound (TVOC) concentrations greater than 5 micrograms per liter ($\mu\text{g}/\text{L}$) in the upper 20 feet of the surficial aquifer across the 1,200-foot wide lateral extent of the southern Site Area boundary.
 - Groundwater below the upper 20 feet of the surficial aquifer that has TVOC concentrations greater than 50 $\mu\text{g}/\text{L}$ across the 1,200-foot wide lateral extent of the southern Site Area boundary.
- Comply with applicable NYSDEC standards, criteria and guidance values (SCGs) for treated water and air emissions.

3. Groundwater Interim Remedial Measure Description

The Groundwater IRM consists of:

- A “pump-and-treat system” where groundwater is:
 - Extracted along the southern portion of the Northrop Grumman Former Plant 24 Access Road via four remedial wells.
 - Conveyed to a treatment plant at McKay Field via four underground pipelines.
 - Treated via air stripping to reduce concentrations of Project and Non-Project VOCs.
 - Filtered to remove oxidized metals.

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- Returned to the aquifer, via a discharge pipeline routed to a recharge basin located on the adjacent former Bethpage Navy Weapons Industrial Reserve Plant (NWIRP) property.
- A vapor phase treatment system that reduces concentrations of Project VOCs in the air stripper off-gas.
- A Groundwater Monitoring Network that is periodically monitored to assess the environmental effectiveness of the Groundwater IRM.

The major components of the Groundwater IRM are:

- Four Remedial Wells (RW-1, RW-2, RW-3, and RW-4) with design pumping rates of 30 gallons per minute (gpm), 75 gpm, 75 gpm, and 30 gpm, respectively, for a total design influent rate of 210 gpm.
- One low-profile air stripper to remove VOCs from the extracted groundwater prior to discharge to the recharge basins.
- Two bag filters configured so that one is “operational” and the other is in “stand by” mode. The system control logic automatically switches from the “operational” filter unit to the “stand by” filter unit when the bag filters are full to prevent a system shut down. The spent filters are then replaced and the unit is placed in “stand by” mode.
- Four emission control units (ECUs), two containing vapor phase granular activated carbon (VPGAC) and two containing potassium permanganate-impregnated zeolite (PPZ). The VPGAC ECUs treat the Project VOCs in the air stripper off gas, except for vinyl chloride, which is treated by the PPZ ECUs.
- The Groundwater Monitoring Network consists of 35 monitoring locations (i.e., 17 groundwater monitoring wells, 4 remedial wells, and 14 piezometers).

Additional information is provided in the OM&M Manual (ARCADIS 2009). The layout of the Groundwater IRM is shown on Figure 2 and a schematic drawing is provided on Figure 3. The groundwater sampling locations that form the Groundwater Monitoring Network are shown on Figure 4. Construction details for the monitoring wells and piezometers are provided as Appendix A.

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4. Operation and Maintenance Activities

In general, the Groundwater IRM operated continuously during the reporting period with the exception of brief shutdown periods for routine maintenance and alarm conditions. Groundwater IRM operation and maintenance (O&M) activities conducted during the reporting period are described below and are summarized in Table 1:

- The system operated full-time, 90 out of 92 days (98 percent uptime).
- The system was monitored during the majority of business days via a site visit, a review of the daily reports, or remotely by wireless computer link-up.
- The Supervisory Control and Data Acquisition (SCADA) system operated as designed, and when conditions warranted (see below), shut the system down automatically and instantaneously, and provided notification of system advisories and alarms to plant operators.
- Intentional system shutdowns included (see Table 1 for more information):
 - Preventative maintenance of Blower B-410, which consisted of replacing the motor bearings and cleaning the blower (July 17, 2013).
 - Preventative quarterly maintenance of Remedial Wells RW-2 and RW-3 and RW-2 pipeline. Maintenance activities consisted of injecting carbon dioxide into the wells and RW-2 pipeline to rehabilitate the pipeline and well and to help address iron fouling issues. Additionally, the RW-2 pump and motor were pulled and replaced with spare parts (July 24 and 25, 2013).
- Unintentional system shutdowns included (see Table 1 for more information):
 - Multiple bag filter faults (July 26 and September 3, 2013) due to bag filters clogging overnight.

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5. Treatment System Compliance and Performance Monitoring

5.1 System Monitoring Activities

The following compliance and performance monitoring activities were performed during this reporting period (see Appendix B, Table B-1 for a summary of the compliance and performance monitoring program requirements):

- Three (3) sampling events to collect required monthly water samples and quarterly air samples.
- Fourteen (14) weekly site visits to monitor and record key system operational parameters.

The system operation and monitoring results are summarized in the following tables, graphs, and appendices:

- An Operational Summary, including monitoring events, system operational days, and noteworthy site activities (Table 1).
- Summary of Influent and Effluent Water Sample Analytical Results (Tables 2 and 3, respectively). Table 3 also provides the Groundwater IRM treatment system removal efficiency. Complete validated Water Sample Analytical Result Summaries for each sampling event are included in Appendix B.
- Summary of Influent and Effluent Vapor Sample Analytical Results (Tables 4 and 5, respectively). Table 5 also provides the Groundwater IRM treatment system removal efficiency. Complete, validated Vapor Sample Analytical Results, for each sample event, are included in Appendix C.
- System Parameters including flow rates, line pressures, and temperatures (Table 6).
- Summary of Groundwater Recovered, VOC Mass Recovered, and VOC Recovery Rates (Table 7). Table 7 provides a breakdown of these parameters by Remedial Well and System and also breaks down the VOC Mass Recovered and VOC Recovery Rates into Project, Non-Project, and Total VOCs.
- Air Discharge Quality Evaluation and Compliance Table (Appendix D and Table 8, respectively).

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- Concentrations of VOCs and Metals in Remedial Well Groundwater Samples (Tables 9 and 10, respectively).
- Cumulative Total, Project, and Non-Project VOC Mass Removed (Figure 5).
- Remedial Well Total, Project, and Non-Project VOC Concentrations (Figures 6A, 6B, and 6C, respectively).
- Influent Total, Project, and Non-Project VOC Concentrations (Figure 7).
- Total, Project, and Non-Project VOC Mass Recovery Rates (Figures 8A, 8B, and 8C, respectively).

5.2 Summary of OM&M Results and Conclusions

5.2.1 System Operation and Effectiveness

Groundwater IRM OM&M results and conclusions for the reporting period are summarized below:

- Total volume of groundwater recovered and treated (Table 7):
 - 3rd Quarter 2013: 30 million gallons.
 - Cumulative Total: 435 million gallons.
- Total VOC mass recovered (Table 7 and Figures 5, 8A, 8B, and 8C):
 - 3rd Quarter 2013: 46 pounds (lbs) of VOCs.
 - Cumulative Total: 1,933 lbs of VOCs.
 - The majority of VOCs recovered during this quarterly reporting period were Project VOCs (70% or 32 lbs), which continues the trend that started in the fourth quarter of 2012.
- Well-specific VOC mass recovered and mass removal rates (Table 7 and Figures 8A, 8B, and 8C):
 - The majority of Project VOCs were recovered by RW-2 (96%) and RW-3 (4%).

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- The majority of the Non-Project VOCs were recovered by RW-3 (67%) and RW-4 (29%).
- Treatment system influent concentrations (Table 2 and Figure 7):
 - Project VOC influent concentrations (81 µg/L to 87 µg/L) are generally consistent with concentrations since the middle of 2010, and are significantly below the peak concentration of approximately 1,000 µg/L (in July, 2009).
 - Non-Project influent concentrations (35 µg/L to 44 µg/L) are continuing the decreasing trend that started in 2010, and are well below the peak concentration of 650 µg/L (in May 2010).
- Total Project VOC concentrations in Remedial Wells RW-1 and RW-4 are below 5 µg/L, which is the most stringent RAO (Table 9).
- Metals concentrations in the remedial wells during this reporting period (Table 10) are consistent with historical metals concentrations with the exception of the elevated iron concentration (1,200 µg/L total iron) in the July 2013 RW-2 sample. The elevated RW-2 total iron concentration is believed to be attributed to the iron precipitate that coats the well and pipeline, specifically, small pieces of the iron precipitate can break off and become entrained in the influent groundwater.
- The air stripper, air stripper off-gas treatment system, and bag filter system performed within acceptable parameters for this reporting period, as indicated by:
 - The air stripper VOC removal efficiency was greater than 99.9 percent for Project and Non-Project VOCs (Table 3).
 - Both the water and air discharges complied with their applicable standards, criteria, guidance values (SGCs) and discharge limits (Tables 3, 5, and 8).

5.2.2 Regulatory Status of Discharges

5.2.2.1 Air Discharge

To determine the compliance status of air discharge from the Groundwater IRM treatment system, the system's effluent vapor concentrations were compared to NYSDEC Division of Air Resources Air Guide-1 (DAR-1) Model Short-term Guideline Concentrations (SGCs [NYSDEC 2010]) (Table 5) and the effluent vapor laboratory

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results were compared to a site-specific modeled annual maximum allowable stack concentration (MASC). The annual MASC was calculated during each monitoring event for individual compounds using the output from the USEPA SCREEN3 Model in conjunction with the NYSDEC DAR-1 AGCs. A scaling factor was calculated using the SCREEN3 model with site-specific physical layout information (e.g. building dimensions, stack height, terrain, etc.) and operating data (e.g. air flow rate, temperature, etc.) inputs for each monitoring event. The scaling factor was then used to adjust (scale) the NYSDEC DAR-1 AGC to a site-specific MASC. A summary of the instantaneous percent (i.e., not time-weighted) of the site-specific annual MASC for Project VOCs, Freon 12, and Freon 22 is provided in Table 8. A summary of the cumulative annual percent (i.e. time-weighted) of the site-specific MASC for detected compounds is also provided in Table 8. A summary of the model inputs, outputs, and backup calculations is provided in Appendix D.

The Groundwater IRM air effluent met NYSDEC requirements throughout the reporting period as indicated by the following:

- The measured concentrations of individual VOCs in the vapor effluent did not exceed applicable SGCs (Table 5).
- The measured concentration of individual VOCs in the vapor effluent did not exceed their applicable, instantaneous MASCs, as calculated using the USEPA SCREEN 3 Model (Table 8). Similarly, the time-weighted rolling averages for the individual Project VOCS, Freon 12, and Freon 22 are below their respective MASCs.

5.2.2.2 Water Discharge

The Groundwater IRM treated water effluent met NYSDEC regulatory requirements during the reporting period (Table 3) as indicated by the following:

- The measured concentration of individual VOCs in the treated water effluent were below applicable discharge limits, per the interim SPDES equivalency permit.
- The measured concentration of total iron and total mercury in the treated water effluent were below applicable discharge limits, per the interim SPDES equivalency permit. In addition, total mercury continues to be non-detect and has never been detected in treated water effluent samples since system start-up.

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6. Environmental Effectiveness Monitoring

Groundwater IRM treatment system environmental effectiveness (i.e., hydraulic monitoring and groundwater quality monitoring) activities and results for this reporting period are discussed below.

6.1 Hydraulic Monitoring

6.1.1 Activities

In accordance with OM&M Manual requirements and methodologies (ARCADIS 2009), a quarterly round of groundwater hydraulic monitoring was performed during this reporting period. Specifically, depth-to-water measurements were collected on August 12, 2013 from 35 locations forming the approved monitoring well network (Table 11 and Figure 4).

6.1.2 Results

Figure 4 provides the configuration of the shallow potentiometric surface and the inferred horizontal groundwater flow directions on August 12, 2013 at the Site Area.

An evaluation of vertical hydraulic gradients was also conducted. The vertical hydraulic gradient is a measure of the potential for vertical groundwater flow between two vertically separated, closely spaced observation points (i.e., clustered or nested observation wells). The magnitude of the gradient indicates the steepness of the gradient, and the sign of the gradient indicates the direction of vertical flow (i.e., a positive vertical gradient indicates upward flow, while a negative vertical gradient indicates downward groundwater flow). The gradient does not provide information with respect to the rate of groundwater movement, which is affected by the hydraulic conductivity of the aquifer material through which the water is moving.

Table 12 provides a summary of calculated vertical groundwater hydraulic gradients at key well pairs located along the Site Area southern boundary during the August 12, 2013 hydraulic groundwater monitoring event. The vertical hydraulic gradients generally indicate that shallow groundwater is moving downward and deeper groundwater is being drawn upward towards the recovery well screened intervals.

Figure 9 provides a cross-sectional view of vertical groundwater flow (based on groundwater levels measured on August 12, 2013), combined with a cross section of Project VOC concentrations in groundwater above 5 µg /L (based on results from

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October 2012 groundwater sampling round). Figure 9 indicates groundwater containing Project VOCs above 5 µg/L is being drawn toward the well screens of remedial wells (i.e., RW-1 through RW-4) within the area, which is consistent with the evaluation of vertical groundwater hydraulic gradient.

Figure 9 in combination with Figure 4 indicate that the Groundwater IRM provides effective vertical and horizontal hydraulic control of groundwater containing Project VOC concentrations above 5 µg /L; therefore, the Groundwater IRM satisfies its remedial action objective.

6.2 Groundwater Quality Monitoring

6.2.1 Activities

Consistent with the OM&M Manual (ARCADIS 2009), groundwater quality monitoring was not required during the Third Quarter of 2013.

6.2.2 Results

Historical groundwater quality data are summarized on the following tables:

- Table 13 summarizes the results of laboratory analysis of VOCs in groundwater samples collected from the groundwater network wells to date.
- Table 14 summarizes the results of laboratory analysis of metals in groundwater samples collected from the groundwater network wells to date.

When an appropriate amount of data has been collected, trend graphs will be developed for selected wells.

6.3 Environmental Effectiveness Monitoring Conclusions

Evaluation of the operational hydraulic groundwater monitoring data, as shown on Figure 4, indicates that the Groundwater IRM is operating as designed and the associated capture zone has developed.

Figure 9 indicates that the Groundwater IRM is preventing the off-site migration of groundwater with Project VOC concentrations greater than 5 µg/L.

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7. Groundwater IRM Recommendations

- Remove mercury from the SPDES equivalency monitoring program because mercury has never been detected in system effluent water samples analyzed for mercury.
- Continue operating, maintaining, and monitoring the system in accordance with the OM&M Manual (ARCADIS 2009) including the current quarterly preventive maintenance program performed at Remedial Wells RW-2 and RW-3 to remove iron build-up in the wells and pipelines.
- Based on the consistent operation of the Groundwater IRM since July 2009, we recommend that the current, quarterly reporting frequency be reduced to annual. Consistent with the NYSDEC-approved OM&M Manual (ARCADIS 2009), an annual report will be prepared to summarize system operation, performance, and monitoring data; this annual report will be prepared and submitted under the supervision of a licensed, professional engineer. Additionally, pertinent data collected for the Groundwater IRM will be submitted to the NYSDEC as part of the semi-annual progress reports currently completed in accordance with Section III of AOC Index #W1-0018-04-01. Upon receipt of NYSDEC approval of this recommendation, the OM&M Manual (ARCADIS 2009) will be updated to reflect this change.



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8. References

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Tables

Table 1. Operational Summary, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.

MONTH	DAY																													Days Operational ⁽¹⁾		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
2009 Total																																160
2010 Total																																352
2011 Total																																351
2012 Total																																353
Jan-13	b	#/#	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	31		
Feb-13	b	#/#/*/*b	b	(2)	b	b	b	(3)b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	(4)	b	b	b	b	b	25		
Mar-13	b	bb	(4)bbb	#/# b	(5)	b	b	(5)	b	b	b	(5.6)b	(5)	b	b	b	b	b	b	b	b	b	b	b	(5)	b	b	b	b	30		
Apr-13	#/#/*/*b	b	b	b	(7)	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	(8)b	b	b	b	b	b	b	b	30			
May-13	b	b	b	#/#	b	b	(9)b	b	b	(10)b	b	b	(11)	b	b	(12)b	b	(13)b	b	(14)b	b	b	b	b	b	(15)b	b	b	29			
Jun-13	b	(16)	b	#/#	b	b	(17)b	b	b	b	(18)	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	30			
Jul-13	#/#/*/*b	b	b	bb	b	b	b	b	b	b	(19)	b	b	b	b	b	b	b	(20)bbbb	(21)b	b	b	b	b	b	b	b	b	29			
Aug-13	b	#/#	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	31			
Sep-13	#/#(22)bb	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	30			
Q3 2013																															90	
Year to Date																															265	
TOTAL																															1,481	

Legend:

- Indicates system online for at least the majority of the day.
- Indicates system operated with reduced flow rates.
- Indicates system off-line for at least the majority of the day.
- # Indicates water compliance samples were collected.
- ## Indicates water performance samples were collected.
- ** Indicates vapor compliance samples were collected.
- * Indicates vapor performance samples were collected.
- b Indicates filter bag unit changed over.

Acronyms\Key:

- | | |
|-----|---------------------------|
| IRM | Interim Remedial Measure. |
| BF | Bag Filter |

Table 1. Operational Summary, Groundwater Interim Remedial Measure, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York.

Notes:

(1) Days in which the system was operational for the majority of the day are counted as one day.

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- (2) The system was intentionally shut down at ~4:15 PM on February 8, 2013 in anticipation of Winter Storm Nemo. The system was restarted at ~ 11AM on February 10, 2013 after the storm had passed and the system had been inspected for potential damage.
- (3) The system shut down at 2:36 AM on February 14, 2013 due to both 401 BF & 402 BF fouling over a shorter than expected time frame, resulting in high-high pressure alarm and system shutdown. The system was restarted later that morning and was off-line for approximately 9.5 hours.
- (4) The system was shut down at 9:05 AM on February 27, 2013 for preventative maintenance activities at Remedial Wells RW-2 and RW-3. In addition to the rehabilitation program, the RW-2 pump was pulled, replaced with a spare pump, and subsequently cleaned for future use. Upon initial restart, the system shut down due a low pressure alarm caused by a plugged secondary, fail-safe (SFSI) pressure switch. The switch was cleaned and system was restarted at ~ 3PM on March 1, 2013. The system was down for approximately 77 hours. Over the next two days (March 2 & 3, 2013) multiple bag filter switchovers occurred and at one point the system was off-line for approximately 5.5 hours because two switchovers occurred in rapid succession.
- (5) Between March 5 and March 28, the system shut down five (5) times due to problems associated with the RW-2 and RW-3 SFSI pressure switches, specifically:
 - a) The system shut down at 10:34 AM on March 5, 2013 due to a low-pressure alarm. System was checked and restarted that afternoon, and was off-line for approximately 2.5 hours.
 - b) The system shut down at 1:43 PM on March 9, 2013 due to a low-pressure alarm. The RW-2 and RW-3 switches were manually cleaned, and system was restarted the next morning, with RW-3 running at a reduced flow rate of 65 gpm. The system was off-line for approximately 21 hours.
 - c) The system could not be restarted after the air stripper cleaning on March 14, 2013 (see Note 6) due to pressure switch issues. The problematic RW-3 pressure switch was switched with the RW-4 pressure switch, and the system was restarted.
 - d) The system shut down at 11:54 AM on March 15, 2013 due to a low-pressure alarm from the failing RW-4 SFSI pressure switch. The primary RW-4 pressure switch was tested was working correctly. The problematic, secondary/redundant switch (the SFSI switch) was taken off-line. The system was restarted that afternoon and was off-line for approximately 3.25 hours. [Problematic SFSI switches were replaced on May 13, 2013, See Note 10]
 - e) The system shut down at 12:26 PM March 28, 2013 due to a problematic SFSI switch. The system was restarted later that afternoon and was off-line for approximately 2 hours.
- (6) The system was shut down at 10:32 AM on March 14, 2013 for a periodic air stripper cleaning using a pressure washer. After the air stripper cleaning, there was a problem restarting the system (see Note 5c). The system was restarted that afternoon and was off-line for approximately 6 hours.

2nd Quarter 2013

- (7) The system shut down at 3:36 PM on April 9, 2013 due to blower discharge high-pressure alarm. The air flow rate was temporarily reduced and the system was restarted later that afternoon and was off-line for approximately 0.8 hours.
- (8) The system shut down twice on April 25, 2013, at 11:38 AM and 1:55 pm, due to temporary power supply interruptions. The system was restarted at 12:08 PM and 2:11 PM, respectively, after the system was inspected for any problems. The system was off-line for a total of approximately 1 hour.
- (9) The system was shut down at 9:25 AM on May 10, 2013 to remove iron precipitate build-up in the RW-2 and RW-3 valves located in the treatment building. The system was restarted that afternoon and was off-line for approximately 7 hours.
- (10) The problematic SFSI pressure switches (see Note 5 above) were replaced on May 13, 2013.
- (11) The system shut down at 7:43 PM on May 17, 2013 due to a temporary power supply interruption. The system was restarted the next morning after the system was inspected for any problems. The system was off-line for approximately 12 hours.
- (12) The system was run with Remedial Well RW-2 off-line from 8:21 AM to 1:30 PM and from 3:11 PM to 5:32 PM on May 20, 2013 for a pipeline inspection. The system was operated at a reduced flow rate for approximately 6.5 hours.
- (13) The system was shut down at 08:11 AM on May 22, 2013 for preventative maintenance activities at Remedial Wells RW-2 and RW-3. In addition to the normal rehabilitation work, the RW-2 and RW-3 pumps were pulled and replaced with spare pumps and motors. The system was restarted the next day and was off-line for approximately 29 hours. Multiple bag filter switches occurred during the start up of the system.

Table 1. Operational Summary, Groundwater Interim Remedial Measure, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York.

Notes continued:

- (14) The system shut down at 2:21 AM on May 24, 2013 as a result of rapid succession of bag filter changes overnight. The system was restarted the next morning and was off-line for approximately 8 hours.
- (15) The system was shut down at 7:40 AM on May 30, 2013 for vapor phase granular activated carbon and potassium permanganate change-outs. The system was initially restarted at 4:46 PM that afternoon but the system shut down at 6:01 PM due to blower high discharge pressure. The blower's VFD settings were changed and the system was restarted at 7:13 PM. The system was off-line for approximately 10 hours.
- (16) The system was shut down at 1:07 PM on June 3, 2013 for a periodic air stripper cleaning using a pressure washer. The system was restarted at 6:46 PM and was off-line for approximately 5.8 hours.
- (17) The system was shut down at 2:30 PM on June 10, 2013 for a periodic air stripper cleaning using a pressure washer. The system was restarted at 6:53 PM and was off-line for approximately 4.5 hours.
- (18) The system shut down at 3:21 AM on June 16, 2013 due to a temporary power supply interruption. The system was restarted at 10:06 AM after the system was inspected for any problems. The system was off-line for approximately 5.6 hours.

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- (19) The system was shut down at 8:01 AM on July 17, 2013 for preventative maintenance of Blower B-410. The work consisted of the removal of B-410 and cleaning and replacement of the bearings. The system was restarted at 5:23 PM on July 17, 2013 and was offline for approximately 9.5 hours.
- (20) The system was shut down at 7:43 AM on July 24, 2013 for preventative maintenance activities at Remedial Wells RW-2 and RW-3. In addition to the normal rehabilitation work, the RW-2 pipeline was cleaned and the RW-2 pump and motor was pulled and replaced with spares. The system was left off-line overnight and was restarted at 7:39 PM on July 25, 2013. The system was offline for approximately 36 hours.
- (21) The system shut down at 3:27 AM on July 26, 2013 due to multiple bag filter switches. The system was restarted at 10:10 AM on July 26, 2013 and was offline for approximately 6.8 hours.
- (22) The system shut down at 8:08 AM on September 3, 2013 as a result of multiple bag filter changes overnight. The system was restarted at 12:57 PM on September 3, 2013 and was off-line for approximately 4.5 hours.

Table 2. Summary of Influent Water Sample Analytical Results, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

Compound ⁽²⁾	10/01/12 (µg/L)	11/12/12 (µg/L)	12/03/12 (µg/L)	01/07/13 (µg/L)	02/04/13 (µg/L)	03/04/13 (µg/L)	04/01/13 (µg/L)	05/06/13 (µg/L)	06/06/13 (µg/L)	07/01/13 (µg/L)	08/05/13 (µg/L)	09/03/13 (µg/L)
Project VOCs												
1,1,1 - Trichloroethane	ND											
1,1 - Dichloroethane	0.47	0.51	0.53	0.48	0.42	0.71	0.59	0.50	0.51	0.46	0.41	0.41
1,2 - Dichloroethane	ND											
1,1 - Dichloroethene	0.36	0.26	0.34	0.25	ND	0.44	0.29	0.22	0.23	0.24	0.23	0.20
Tetrachloroethene	0.34	0.31	0.38	0.34	0.30	0.34	0.44	0.29	0.35	0.35	0.27	0.33
Trichloroethene	7.0	6.8	6.3	5.9	5.4	7.3	5.4	5.1	5.6	5.3	5.7	4.8
Vinyl Chloride	15	17	17	16	17	52	27	25	27	22	25	22
cis 1,2-Dichloroethene	54	47	44	38	40	80	51	45	45	31	33	30
trans 1,2-Dichloroethene	ND											
Benzene	ND											
Toluene	23	26	21	17	13	59	28	25	39	22	20	21
Xylenes	1.9	2.2	1.9	1.8	1.6	6.1	2.9	2.7	3.1	1.7	2.1	2.3
Subtotal Project VOCs	102	100	91	80	78	206	116	104	121	83	87	81
Non-Project VOCs												
Dichlorodifluoromethane (Freon 12)	ND											
Chlorodifluoromethane (Freon 22)	100	110	100	86	85	64	55	48	40	44	41	35
Subtotal Non-Project VOCs	100	110	100	86	85	64	55	48	40	44	41	35
Total VOCs⁽³⁾	202	210	191	166	163	270	171	152	161	127	128	116
Inorganics												
Total Iron	400	330	840	370	510	370	310	750	1,010	520	1030	350
Total Mercury	NA											
pH⁽⁴⁾	5.5	5.6	5.3	5.9	5.7	5.4 ⁽⁵⁾	5.6	5.5	5.6	5.6	6.6	5.4

See notes on last page.

Table 2. Summary of Influent Water Sample Analytical Results, Groundwater Interim Remedial Measure, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

Notes:

- (1) Water samples collected by ARCADIS on the dates shown and submitted to ALS Environmental for VOC analyses per NYSDEC ASP 2005, Method OLM 4.3, for iron analyses per USEPA Method 6010C and for mercury analyses per USEPA Method 7470A. The VOC analyte list is provided in the DRAFT Groundwater IRM OM&M Manual (ARCADIS 2009). Influent water samples were collected from Water Sampling Port-5 (WSP-5); refer to Figure 3 of this OM&M Report for the schematic location of WSP-5. Data in this table corresponds to approximately the past year of system operation.
- (2) Only VOCs associated with the interim SPDES equivalency program, plus Toluene, Benzene, Xylenes, non-project related Freon 12 and Freon 22, Mercury and Iron are included in this table. Complete VOC and inorganic data summary tables, including VOC TICs, are provided in Appendix B. Laboratory data qualifiers are included in the Appendix B tables.
- (3) "Total VOCs" represents the sum of individual concentrations of the compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.
- (4) pH samples collected and measured in the field by ARCADIS personnel on the dates listed using an Oakton Model 300 pH/conductivity meter. pH units are standard units.
- (5) The March 2013 pH influent data was compromised, so an estimated value based on the average of available pH values (from Remedial Wells RW-2 and RW-3) is provided.

Acronyms\Key:

700	Bold data indicates that the analyte was detected at or above its reporting limit.
16	Data that is not bold indicates analyte detected but below its reporting limit; the value is estimated.
IRM	Interim remedial measure.
NA	Not analyzed.
ND	Analyte not detected at, or above its laboratory quantification limit.
NYSDEC	New York State Department of Environmental Conservation.
OM&M	Operation, maintenance and monitoring.
SPDES	State Pollutant Discharge Elimination System
TICs	Tentatively identified compounds.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
µg/L	Micrograms per liter.

Table 3. Summary of Effluent Water Sample Analytical Results, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

Compound ⁽²⁾	Discharge												
	Limit ⁽³⁾ (µg/L)	10/01/12 (µg/L)	11/12/12 (µg/L)	12/03/12 (µg/L)	01/07/13 (µg/L)	02/04/13 (µg/L)	03/04/13 (µg/L)	04/01/13 (µg/L)	05/06/13 (µg/L)	06/06/13 (µg/L)	07/01/13 (µg/L)	08/06/13 (µg/L)	09/03/13 (µg/L)
Project VOCs													
1,1,1 - Trichloroethane	5	ND											
1,1 - Dichloroethane	5	ND											
1,2 - Dichloroethane	5	ND											
1,1 - Dichloroethene	5	ND											
Tetrachloroethene	5	ND											
Trichloroethene	5	ND											
Vinyl Chloride	5	ND											
cis 1,2-Dichloroethene	5	ND											
trans 1,2-Dichloroethene	5	ND											
Benzene	5	ND											
Toluene	5	ND											
Xylenes	5	ND											
Subtotal Project VOCs	--	0.0											
Non-Project VOCs													
Dichlorodifluoromethane (Freon 12)	5	ND											
Chlorodifluoromethane (Freon 22)	5	ND											
Subtotal Non-Project VOCs	--	0											
Total VOCs⁽⁴⁾	--	0.0											
Treatment Efficiency⁽⁵⁾	--	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%
Inorganics													
Total Iron	600	430	270	230	140	370	560	270	270	310	220	390	350
Total Mercury	250	ND											
pH⁽⁶⁾	5.5 - 8.5	6.7	6.4	6.4	6.7	7.5	6.7	6.9	6.3	6.4	5.9	5.7	6.7

See notes on last page.

Table 3. Summary of Effluent Water Sample Analytical Results, Groundwater Interim Remedial Measure, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York. ⁽¹⁾

Notes:

- (1) Water samples collected by ARCADIS on the dates shown and submitted to ALS Environmental for VOC analyses per NYSDEC ASP 2005, Method OLM 4.3, for iron analyses per USEPA Method 6010C and for mercury analyses per USEPA Method 7470A. The VOC analyte list is provided in the DRAFT Groundwater IRM OM&M Manual (ARCADIS 2009). Effluent water samples were collected from Water Sampling Port-7 (WSP-7); refer to Figure 3 of this OM&M Report for the location of WSP-7. Data in this tables corresponds to approximately the past year of system operation.
- (2) Only VOCs associated with the interim SPDES equivalency program, including Toluene, Benzene, Xylenes, non-project related Freon 12 and Freon 22, Mercury and Iron are included in this table. Complete VOC and inorganic data summary tables, including VOC TICs, are provided in Appendix B. Laboratory data qualifiers are included in the Appendix B tables.
- (3) Discharge limits per the interim SPDES equivalency program or Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) Quality Standards and Guidance Values and Groundwater Effluent Limitations, if the compound is not part of the interim SPDES equivalency program.
- (4) "Total VOCs" represents the sum of individual concentrations of compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.
- (5) Treatment efficiency was calculated by dividing the difference between the influent and effluent total VOC concentrations by the influent total VOC concentration.
- (6) Influent pH samples collected and measured in the field by ARCADIS personnel on the dates listed using an Oakton Model 300 pH/conductivity meter. pH units are standard units.

Acronyms\Key:

- 700** Bold data indicates that the analyte was detected at or above its reporting limit.
16 Data that is not bold indicates analyte detected but below its reporting limit; the value is estimated.
IRM Interim remedial measure.
ND Analyte not detected at, or above its laboratory quantification limit.
NYSDEC New York State Department of Environmental Conservation.
OM&M Operation, maintenance, and monitoring.
SPDES State Pollutant Discharge Elimination System
TICs Tentatively identified compounds.
USEPA United States Environmental Protection Agency.
VOC Volatile organic compound.
µg/L Micrograms per liter.
-- Not applicable.
> Greater than.

Table 4. Summary of Influent Vapor Sample Analytical Results, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

Compound ⁽²⁾	07/05/12 (µg/m ³)	10/03/12 (µg/m ³)	12/03/12 (µg/m ³)	02/04/13 (µg/m ³)	4/1/2013 ⁽⁴⁾ (µg/m ³)	7/1/2013 (µg/m ³)
Project VOCs						
1,1,1 - Trichloroethane	ND	ND	2.4	ND	2.2	ND
1,1 - Dichloroethane	7.5	8.9	11	6.2	8.6	6.8
1,2 - Dichloroethane	ND	ND	ND	ND	0.67	ND
1,1 - Dichloroethene	4.2	ND	4.6	ND	3.9	3.2
Tetrachloroethene	4.0	5.3	5.9	ND	4.7	4.3
Trichloroethene	110	110	110	63	97	78
Vinyl Chloride	160	210	310	210	340	290
cis 1,2-Dichloroethene	900	900	1,000	560	880	570
trans 1,2-Dichloroethene	ND	ND	1.3	ND	0.87	ND
Benzene	ND	ND	4.8	ND	1.3	ND
Toluene	290	400	420	46	510	380
Xylenes	30	39	48	ND	58	41
Subtotal Project VOCs	1,506	1,673	1,918	885	1,907	1,373
Non-Project VOCs						
Dichlorodifluoromethane (Freon 12)	3.1	ND	3.6	ND	2.7	2.6
Chlorodifluoromethane (Freon 22)	1,300	1,000	1,100	730	560	540
Subtotal Non-Project VOCs	1,303	1,000	1,104	730	563	543
Total VOCs⁽³⁾	2,809	2,673	3,022	1,615	2,470	1,916

See notes on last page.

Table 4. Summary of Influent Vapor Sample Analytical Results, Groundwater Interim Remedial Measure, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

Notes:

- (1) Vapor samples collected by ARCADIS on the dates shown and submitted to ALS Environmental for VOC analyses per Modified USEPA Method T0-15. A VOC analyte list is provided in the DRAFT Groundwater IRM OM&M Manual (ARCADIS 2009). Influent samples were collected at Vapor Sampling Port-1 (VSP-1); refer to Figure 3 of this OM&M Report for the location of VSP-1. Data in this table corresponds to approximately the past year of system operation.
- (2) Only VOCs that are associated with the interim State Pollutant Discharge Elimination System (SPDES) equivalency program, Toluene, Benzene, Xylenes, and non-project related Freon 12 and Freon 22 are included in this table. Complete VOC summary tables, including VOC TICs, are provided in Appendix C. Laboratory data qualifiers are included in the Appendix C tables.
- (3) "Total VOCs" represents the sum of individual concentrations of compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.
- (4) The data for the April 2013 influent sample is "estimated" because the summa cannister's vacuum was lower than laboratory protocols allow for proper quantification.

Acronyms\Key:

- 700** Bold data indicates that the analyte was detected at or above its reporting limit.
- 16 Data that is not bold indicates analyte detected but below its reporting limit; the value is estimated.
- IRM** Interim remedial measure.
- ND** Analyte not detected at or above its laboratory reporting limit.
- OM&M** Operation, maintenance, and monitoring.
- TICs** Tentatively identified compounds.
- USEPA** United States Environmental Protection Agency.
- VOC** Volatile organic compound.
- µg/m³** Micrograms per cubic meter.

Table 5. Summary of Effluent Vapor Sample Analytical Results, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

Compound ⁽²⁾	Discharge Limit ⁽³⁾ (µg/m³)	07/05/12 (µg/m³)	10/03/12 (µg/m³)	12/03/12 (µg/m³)	02/04/13 (µg/m³)	04/01/13 (µg/m³)	7/1/2013 (µg/m³)
Project VOCs							
1,1,1 - Trichloroethane	9,000	ND	ND	ND	ND	ND	ND
1,1 - Dichloroethane	NS	0.82	1.1	1.8	1.8	4.1	1.6
1,2 - Dichloroethane	NS	ND	ND	ND	ND	ND	ND
1,1 - Dichloroethene	380 ⁽⁴⁾	ND	ND	1.0	3.3	5.3	ND
Tetrachloroethene	1,000	ND	ND	ND	ND	ND	ND
Trichloroethene	14,000	1.6	3.1	4.3	4.6	3.8	2
Vinyl Chloride	180,000	ND	7.9	23	57	42	50
cis 1,2-Dichloroethene	190,000 ⁽⁵⁾	2.0	9.6	25	46	43	25
trans 1,2-Dichloroethene	NS	ND	ND	ND	ND	ND	ND
Benzene	1,300	0.96	ND	1.9	1.1	2.3	1.7
Toluene	37,000	27	37	38	20	49	20
Xylenes	4,300	ND	2.8	4.3	2.6	4.4	ND
Subtotal Project VOCs	NA	32	62	99	136	154	100
Non-Project VOCs							
Dichlorodifluoromethane (Freon 12)	NS	2.9	3.1	3.5	2.6	2.8	2.7
Chlorodifluoromethane (Freon 22)	NS	1,000	1,000	1,100	820	560	520
Subtotal Non-Project VOCs	NA	1,003	1,003	1,104	823	563	523
Total VOCs⁽⁶⁾	NA	1,035	1,065	1,203	959	717	623
Treatment Efficiency (Total VOCs)⁽⁷⁾	NA	63.1%	60.2%	60.2%	40.6%	71.0%	67.5%
Treatment Efficiency (Project VOCs)⁽⁸⁾	NA	97.8%	96.3%	94.8%	84.6%	91.9%	92.7%

See notes on last page.

Table 5. Summary of Effluent Vapor Sample Analytical Results, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

Notes:

- (1) Vapor samples collected by ARCADIS on the dates shown and submitted to ALS Environmental for VOC analyses per Modified USEPA Method T0-15. A VOC analyte list is provided in the DRAFT Groundwater IRM OM&M Manual (ARCADIS 2009). Effluent samples were collected at Vapor Sampling Port-5 (VSP-5); refer to Figure 3 of this OM&M Report for the location of VSP-5. Data in this tables corresponds to approximately the past year of system operation.
- (2) Only VOCs that are associated with the interim SPDES equivalency program, Toluene, Benzene, Xylenes, and non-project related Freon 12 and Freon 22 are included in this table. Complete VOC summary tables, including VOC TICs, are provided in Appendix C. Laboratory data qualifiers are included in the Appendix C tables.
- (3) Discharge limit is compound specific short-term guidance concentration (SGC) per the NYSDEC DAR-1 AGC/SGC tables revised October 18, 2010.
- (4) An SGC was not provided in the DAR-1 AGC/SGC Tables, dated October 18, 2010. An interim SGC was developed based on guidance of the New York State DAR-1 Guidelines for the Control of Toxic Ambient Air Contaminants, 1991 edition. Specifically for 1,1-dichloroethene, which is not defined as provided in Section IV.A.2.b.1 a high-toxicity compound, the Interim SGC = (smaller of Time Weighted Average [TWA] - Threshold Limit Value or TWA - Recommended Exposure Limit)/4.2. or 1,600 µg/m³ / 4.2 = approximately 380 µg/m³. An interim SGC was developed for this compound because it has a moderate toxicity rating, as specified in the DAR-1 AGC/SGC Tables, dated October 18, 2010.
- (5) An SGC was not provided in the DAR-1 AGC/SGC Tables, dated October 18, 2010. An interim SGC was developed based on guidance provided in Section IV.A.2.b.1 of the New York State DAR-1 Guidelines for the Control of Toxic Ambient Air Contaminants, 1991 edition. Specifically for cis-1,2 dichloroethene, which is not defined as a high-toxicity compound, the interim SGC = (smaller of Time Weighted Average [TWA] - Threshold Limit Value or TWA - Recommended Exposure Limit)/4.2 or 790,000 µg/m³ / 4.2 = approximately 190,000 µg/m³. An interim SGC was developed for this compound because it has a moderate toxicity rating, as specified in the DAR-1 AGC/SGC Tables, dated October 18, 2010.
- (6) "Total VOCs" represents the sum of individual concentrations of all compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.
- (7) Treatment efficiency was calculated by dividing the difference between the influent and effluent Total VOC concentrations by the influent Total VOC concentration. Treatment efficiency is only calculated when there is a corresponding influent sample.
- (8) Treatment efficiency was calculated by dividing the difference between the influent and effluent total Project VOC concentrations by the influent total Project VOC concentration. Treatment efficiency is only calculated when there is a corresponding influent sample.

Acronyms\Key:

700	Bold data indicates that the analyte was detected at or above its reporting limit.
16	Data that is not bold indicates analyte detected but below its reporting limit; the value is estimated.
AGC	Annual guideline concentration.
IRM	Interim remedial measure.
NA	Not applicable.
ND	Analyte not detected at or above its laboratory reporting limit.
NS	Guideline concentrations not specified in the NYSDEC DAR-1 AGC/SGC tables revised September 10, 2007. An interim SGC was not developed for these compounds because they have low toxicity ratings in the NYSDEC DAR-1 AGC/SGC tables revised October 18, 2010.
NYSDEC	New York State Department of Environmental Conservation.
OM&M	Operation, maintenance, and monitoring.
SPDES	State Pollutant Discharge Elimination System
TICs	Tentatively identified compounds.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
µg/m ³	Micrograms per cubic meter.

Table 6. Summary of System Parameters, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.

Date ⁽¹⁾	Water Flow Rates ^{(2), (8)}						Water Pressures ^{(2), (8)}						Air Flow Rate ^{(2), (8)}	Air Pressures ⁽²⁾				Air Temp. ⁽²⁾
	Remedial Well				Combined Influent (gpm)	Effluent (gpm)	Remedial Well Effluent ⁽³⁾				Effluent (psi)	Effluent (scfm)	ECU Influentes				Effluent (inH ₂ O)	
	RW-1 (gpm)	RW-2 (gpm)	RW-3 (gpm)	RW-4 (gpm)			RW-1 (psi)	RW-2 (psi)	RW-3 (psi)	RW-4 (psi)			GAC-501 (inH ₂ O)	GAC-502 (inH ₂ O)	PPZ-601 (inH ₂ O)	PPZ-602 (inH ₂ O)	Stack Temp. (°R)	
10/01/12 ⁽⁶⁾	30.1	72.4	75.1	30.1	212	237	58.0	32.2	51.9	57.5	8.0	1,813	7.2	2.9	1.0	1.9	0.0	538 ⁽⁵⁾
11/12/12	30.3	69.3	74.9	31.1	210	223	57.6	22.0	46.0	56.0	8.5	1,963	7.5	2.8	0.9	1.9	0.0	522
12/03/12 ⁽⁷⁾	31.3	64.6	74.3	30.9	207	207	56.5	19.3	43.0	55.9	8.0	1,962	7.5	2.8	1.0	1.9	0.0	533 ⁽⁴⁾
01/07/13 ⁽⁸⁾	31.2	66.4	75.4	31.8	206	215	57	24	37	56	10	1,934	6.5	2.5	1.0	1.8	0.0	516
02/04/13	31.3	62.6	73.1	30.8	198	204	57	26	34	57	7	1,885	7.0	2.5	0.5	1.5	0.0	525
03/04/13	31.7	77.8	72.7	31.3	214	231	57	28	25	56	8	1,900	6.5	2.5	0.5	1.5	0.0	529
04/01/13	32.3	70.2	65.7	32.4	200	205	57	37	37	56	7.5	1,899	7	2.25	0.0	1.5	0.0	528
05/06/13	31.7	66.1	60.8	32.3	191	190	57	33	33	56	7 ⁽⁹⁾	1,864	6.6	2.5	0.9	2.0	0.0	536
06/06/13	31.4	76.9	78.6	30.9	218	221	57	27	51	57	8	1,811	4.4	5.0	1.7	0.5	0.0	530
07/01/13	31.2	74.9	82.6	31.3	220	229	58	20	37	57	9	2,003	5.5	6.5	2.0	1.0	0.0	534
08/05/13	33.6	82.5	81.2	31.6	229	248	56	24	38	57	9	2,029	9.0	10.0	6.5	5.0	0.0	532
09/03/13	31.3	78.4	79.4	31.3	220	250	58	22	37	57	10	1,998	9.0	10.0	6.0	4.5	0.0	540

See notes on last page.

Table 6. Summary of System Parameters, Groundwater Interim Remedial Measure, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York.

Notes:

- (1) Operational data collected by ARCADIS on days noted. Parameters listed were typically recorded during compliance monitoring events. Data in this table corresponds to approximately the past year of system operation.
- (2) Instantaneous values from field-mounted instruments, except for the combined influent water-flow rate, which is the sum of individual well flow rates via the Supervisory Control and Data Acquisition (SCADA) System.
- (3) Remedial Well effluent pressure readings measured at the influent manifold within the treatment system building.
- (4) Stack temperature measured using infrared temperature gun.
- (5) ECU Mid-train temperature used because stack effluent gauge could not be read.
- (6) Water samples taken on October 1, 2012, air samples taken on October 3, 2012. Air parameters shown reflect conditions on the air sampling date.
- (7) Influent pressures to ECUs not recorded on day of sampling, the average of the next two site visits in December were used.
- (8) Starting with January's 2013 site visit the following instantaneous parameters are obtained from the SCADA HMI: Water Flow Rate, Water Pressure, Air Flow Rate.
- (9) System effluent pressure not recorded on day of sampling, the average of the next two site visits in May were used.

Acronyms\Key:

ECU	Emission control unit.
gpm	Gallons per minute.
inH ₂ O	Inches of water column.
psi	Pounds per square inch.
°R	Degrees Rankine.
scfm	Standard cubic feet per minute.
Temp.	Temperature.

Table 7. Summary of Groundwater Recovered, VOC Mass Recovered, and VOC Mass Recovery Rates, Groundwater Interim Remedial Measure, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York.

Operating Period ⁽¹⁾	Volume of Groundwater Recovered ⁽²⁾ (x1,000 gal) ⁽²⁾						VOC Mass Recovered (lbs) ⁽³⁾												VOC Mass Recovery Rate (lbs/day) ⁽⁴⁾																
							Total VOCs ⁽⁵⁾					Project VOCs ⁽⁶⁾				Non-Project VOCs ⁽⁷⁾				Total VOCs ⁽⁵⁾					Project VOCs ⁽⁶⁾				Non-Project VOCs ⁽⁷⁾						
	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total					
System Pilot Test, Shakedown and Start Up Totals⁽⁸⁾																																			
	137	270	251	150	808	NA	NA	NA	NA	1.1	NA	NA	NA	NA	1.0	NA	NA	NA	NA	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
2009 Totals																																			
07/21/09 - 12/30/09	6,592	13,838	16,445	6,574	43,449	0.17	275	53	14	342	0.17	273	19	0.20	293	<0.01	0.56	35	13	48	<0.01	1.9	0.34	0.089	2.2	<0.01	1.9	0.12	<0.01	1.9	<0.01	0.22	0.082	0.30	
2010 Totals																																			
12/30/09 - 01/05/11	15,726	35,127	38,160	15,689	104,702	0.56	172	412	89	672	0.56	171	28	0.10	200	<0.01	0.17	383	89	469	<0.01	0.46	1.1	0.24	1.8	<0.01	0.46	0.075	<0.01	0.54	<0.01	<0.01	1.0	0.24	1.3
2011 Totals																																			
01/05/11 - 01/09/12	15,218	36,570	37,682	15,196	104,666	0.36	167	271	78	516	0.36	167	35	0.09	203	<0.01	1.1	236	78	314	<0.01	0.45	0.73	0.21	1.4	<0.01	0.45	0.095	<0.01	0.55	<0.01	<0.01	0.64	0.21	0.85
2012 Totals																																			
01/09/12 - 01/07/13	15,260	35,178	36,111	15,336	101,885	0.28	114	113	40	267	0.25	113	12	0.39	126	<0.01	1.5	101	40	141	<0.01	0.31	0.31	0.11	0.73	<0.01	0.31	0.032	<0.01	0.35	<0.01	<0.01	0.28	0.11	0.39
January 2013 through March 2013 Totals																																			
01/07/13 - 02/04/13 ⁽⁹⁾	1,265	2,566	2,964	1,283	8,078	0.013	7.5	5.3	2.1	15	0.013	7.4	0.44	0.029	7.9	<0.01	0.10	4.8	2.0	6.9	<0.01	0.27	0.19	0.075	0.54	<0.01	0.26	0.016	<0.01	0.28	<0.01	<0.01	0.17	0.071	0.25
02/04/13 - 03/04/13	1,080	2,198	2,443	1,080	6,801	0.011	6.4	4.3	1.7	12	0.011	6.4	0.36	0.024	6.8	<0.01	0.087	4.0	1.7	5.8	<0.01	0.23	0.15	0.061	0.43	<0.01	0.23	0.013	<0.01	0.24	<0.01	<0.01	0.14	0.061	0.21
03/04/13 - 04/01/13	1,235	2,890	2,666	1,233	8,024	0.012	8.5	4.7	2.0	15	0.012	8.3	0.40	0.028	8.7	<0.01	0.11	4.3	2.0	6.4	<0.01	0.30	0.17	0.071	0.54	<0.01	0.30	0.014	<0.01	0.31	<0.01	<0.01	0.15	0.071	0.23
Subtotal Jan - Mar 2013⁽¹⁰⁾																																			
April 2013 through June 2013 Totals																																			
04/01/13 - 05/06/13	1,609	3,321	3,162	1,609	9,701	0.015	12	3.9	1.9	18	0.015	12	0.37	0.041	12	<0.01	0.16	3.5	1.9	5.6	<0.01	0.34	0.11	0.054	0.51	<0.01	0.34	0.011	<0.01	0.34	<0.01	<0.01	0.10	0.054	0.16
05/06/13 - 06/06/13	1,271	2,903	2,761	1,271	8,206	0.012	10	3.4	1.5	15	0.012	10	0.33	0.033	10	<0.01	0.14	3.1	1.5	4.7	<0.01	0.32	0.11	0.048	0.48	<0.01	0.32	0.011	<0.01	0.32	<0.01	<0.01	0.10	0.048	0.15
06/06/13 - 07/01/13	1,128	2,846	2,964	1,139	8,077	0.010	10	3.6	1.4	15	0.010	10	0.35	0.029	10	<0.01	0.14	3.3	1.3	4.7	<0.01	0.40	0.14	0.056	0.60	<0.01	0.40	0.014	<0.01	0.40	<0.01	0.01	0.13	0.052	0.19
Subtotal Apr - Jun 2013⁽¹¹⁾																																			
July 2013 through September 2013 Totals																																			
07/01/13 - 08/05/13	1,495	3,729	3,82																																

Table 7. Summary of Groundwater Recovered, VOC Mass Recovered, and VOC Mass Recovery Rates, Groundwater Interim Remedial Measure, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York.

Notes:

- (1) Represents operating period between consecutive monitoring events.
- (2) Volume of groundwater recovered is based on individual local well totalized flow readings. Listed value is the difference between totalized flow values recorded between consecutive monitoring events. The total groundwater recovered during a given operating period is the sum of the individual well flow totals. Values shown are rounded to the nearest gallon, but should only be considered accurate to two significant figures to account for error associated with field measurements.
- (3) Mass recovered per well was calculated by multiplying the TVOC concentration from the most recent sampling event by the number of gallons extracted during the reporting period. The total amount recovered during a given operating period is the sum of masses recovered from each of the individual wells. Values less than ten pounds are presented using two significant figures and values greater than ten pounds have been rounded to the nearest whole number; however, these values should only be considered accurate to two significant figures to account for error associated with field measurements and analytical data.
- (4) Mass recovery rates were calculated by dividing the total mass recovered for each well and for the system by the number of days in the respective operating period. Values are presented using two significant figures.
- (5) "Total VOCs" represents the sum of individual concentrations of the VOCs detected.
- (6) "Project VOCs" represents the sum of individual compound concentrations of 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,2-Dichloroethane; 1,1-Dichloroethene; Tetrachloroethene; Trichloroethelyene, Vinyl Chloride; cis-1,2-Dichloroethene; trans-1,2-Dichloroethene; Benzene; Toluene; and Xylenes-o,m, and p.
- (7) "Non-Project VOCs" represents the difference between Total VOCs and Project VOCs.
- (8) Values based on operational data recorded prior to system startup on July 21, 2009.
- (9) Starting with the January 2013 site visit the totalized water flow readings are recorded from the SCADA HMI.
- (10) The volume of groundwater recovered and mass recovered calculations represent the operational period between January 7, 2013 and April 1, 2013.
- (11) The volume of groundwater recovered and mass recovered calculations represent the operational period between April 1, 2013 and July 1, 2013.
- (12) The volume of groundwater recovered and mass recovered calculations represent the operational period between July 1, 2013 and October 7, 2013.
- (13) The volume of groundwater recovered and mass recovered calculations represent the operational period between January 7, 2013 and October 7, 2013.
- (14) "Total" refers to the amounts removed by the Operable Unit 3 Groundwater Interim Remedial Measure.

Acronyms\Key:

IRM	Interim Remedial Measure.
gal	Gallons.
lbs	Pounds.
lbs/day	Pounds per day.
NA	Not applicable.
TVOC	Total volatile organic compounds.
<	Less than.

Table 8. Summary of Air Emissions Model Output, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.

Compound ⁽¹⁾	AGC ⁽²⁾ ($\mu\text{g}/\text{m}^3$)	7/5/12	10/3/12 ⁽⁵⁾	Percent of MASC Per Event ⁽³⁾ 12/03/12 ⁽⁵⁾	2/4/13	4/1/13	7/1/13	Percent AGC ⁽⁴⁾
1,1,1 - Trichloroethane	5,000	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1,1 - Dichloroethane	0.63	0.02%	0.03%	0.04%	0.04%	0.10%	0.04%	0.05%
1,1 - Dichloroethene	70	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Acetone	30,000	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Chloroform	0.043	1.09%	1.40%	2.00%	1.31%	1.76%	0.99%	1.44%
Ethylbenzene	1,000	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Xylenes (o)	100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Xylenes (m,p)	100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Chloromethane	90	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Tetrachloroethene	1.0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Trichloroethene	0.5	0.05%	0.10%	0.13%	0.14%	0.12%	0.06%	0.11%
Vinyl Chloride	0.11	0.00%	1.11%	3.21%	8.09%	5.91%	6.88%	4.88%
cis 1,2 Dichloroethene	63	0.00%	0.00%	0.01%	0.01%	0.01%	0.01%	0.01%
trans 1,2 Dichloroethene	63	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Benzene	0.13	0.11%	0.00%	0.22%	0.13%	0.27%	0.20%	0.15%
Toluene	5,000	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Dichlorodifluoromethane (Freon 12)	12,000	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Chlorodifluoromethane (Freon 22)	50,000	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Notes:

- (1) Only VOCs that were detected in the effluent vapor sample (VSP-5) over the past year of system operation are included in this table.
- (2) AGC refers to the compound-specific annual guideline concentration per the NYSDEC DAR-1 AGC/SGC tables, revised October 18, 2010. NYSDEC DAR-1 AGCs were scaled using the results of a site-specific annual USEPA SCREEN 3 model to calculate the annual MASC per monitoring event.
- (3) Percent of AGC (or Percent MASC) was calculated by dividing the actual effluent concentration by the site-specific annual MASC. Detailed calculations are included in Appendix D.
- (4) Percent AGC is the twelve month average at the end of the reporting period. The Percent AGC was calculated by time-weighting the "Percent MASCs" for the individual sampling events over the past year. MASCs are typically calculated once per quarter, thus the MASCs for each month within a quarter are assumed to be the same.
- (5) During the fourth quarter 2012 reporting period, additional vapor sampling was performed in December 2012 to monitor VPGAC and PPZ treatment efficiencies. For calculation purposes, each of the 4Q2012 sampling events were assumed to be representative for half the quarter (i.e. 1.5 months).

Acronyms\Key:

AGC	Annual Guideline Concentration.	USEPA	United States Environmental Protection Agency.
DAR-1	Division of Air Resources-1.	VOCs	Volatile Organic Compounds.
MASC	Maximum allowable stack concentration.	$\mu\text{g}/\text{m}^3$	Micrograms per cubic meter.
NYSDEC	New York State Department of Environmental Conservation.	VPGAC	Vapor Phase Granular Activated Carbon
SGC	Short-term Guideline Concentration.	PPZ	Potassium Permanganate Zeolite

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location: Sample Date:	RW-1 7/29/2009	RW-1 8/12/2009	RW-1 9/10/2009	RW-1 11/10/2009	RW-1 12/2/2009	RW-1 2/2/2010
NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	NE	6.5 J	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	NE	3.5 J	< 50	2.9 J	1.5 J	< 50	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	< 5	< 5	< 5	< 5 R	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5	< 5
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	7	3 J	2.4 J	1.9 J	1.4 J	1.3 J	0.8 J
Chloromethane	5	< 5	< 5	< 5	< 5	< 5 R	< 5
cis-1,2-dichloroethene	5	1.5 J	1.5 J	1.4 J	1.5 J	1.7 J	1.5 J
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	5	--	--	--	--	--	< 5
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	5	1.3 J	1.7 J	1.5 J	1.8 J	2 J	2 J
Trichlorofluoromethane (CFC-11)	5	--	--	--	--	--	< 5
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 5	< 5
Total VOCs⁽²⁾		15.8	5.6	7.7	6.2	5.0	4.3
Project VOCs⁽³⁾		2.8	3.2	2.9	3.3	3.7	3.5

See notes on last page.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location: Sample Date:	RW-1 4/12/2010	RW-1 7/20/2010	RW-1 10/4/2010	RW-1 1/10/2011	RW-1 4/8/2011	RW-1 7/8/2011
NYSDEC <u>SCGs</u>							
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	NE	< 50	< 50	< 50	< 50	< 50	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5	< 5
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	7	0.42 J	0.36 J	0.31 J	< 5	< 5	< 5
Chloromethane	5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	5	1.5 J	2 J	1.3 J	1.3 J	0.81 J	0.78 J
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	5	2.4 J	3.4 J	3 J	2.4 J	1.9 J	1.8 J
Trichlorofluoromethane (CFC-11)	5	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 5	< 5
Total VOCs⁽²⁾		4.3	5.8	4.6	3.7	2.7	2.6
Project VOCs⁽³⁾		3.9	5.4	4.3	3.7	2.7	2.6

See notes on last page.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location: Sample Date:	RW-1 10/3/2011	RW-1 1/9/2012	RW-1 4/3/2012	RW-1 7/2/2012	RW-1 10/1/2012	RW-1 1/7/2013	RW-1 4/1/2013	RW-1 7/1/2013
NYSDEC <u>SCGs</u>									
1,1,1-Trichloroethane	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2-Tetrachloroethane	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2-Trichloroethane	1	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1-Dichloroethane	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1-Dichloroethene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloroethane	0.6	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloropropane	1	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
2-Butanone	NE	< 50	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
2-Hexanone	50	< 50	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
4-methyl-2-pentanone	50	< 50	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
Acetone	NE	< 50	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
Benzene	1	< 0.7	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.70 U	< 0.70 U	< 0.70 U
Bromodichloromethane	50	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Bromoform	50	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Bromomethane	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Disulfide	60	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Chlorobenzene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Chloroethane	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Chloroform	7	< 5	0.22 J	0.21 J	0.23 J	< 5 U	< 5 U	< 5.0 U	< 5.0 U
Chloromethane	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
cis-1,2-dichloroethene	5	0.94 J	0.95 J	0.65 J	0.58 J	0.37 J	0.34 J	0.40 J	0.24 J
cis-1,3-dichloropropene	0.4	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Dibromochloromethane	50	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Ethylbenzene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Methyl tert-Butyl Ether	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Methylene Chloride	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Styrene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Tetrachloroethene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Toluene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
trans-1,2-dichloroethene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
trans-1,3-dichloropropene	0.4	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Trichloroethylene	5	1.8 J	1.8 J	1.7 J	1.4 J	0.95 J	0.86 J	0.70 J	0.77 J
Trichlorofluoromethane (CFC-11)	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Vinyl Chloride	2	< 2	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2.0 U	< 2.0 U
Xylene-o	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U
Xylenes - m,p	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U
Total VOCs⁽²⁾		2.7	3.0	2.6	2.2	1.3	1.2	1.1	1.0
Project VOCs⁽³⁾		2.7	2.8	2.4	2.0	1.3	1.2	1.1	1.0

See notes on last page.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-2	RW-2	RW-2	RW-2	RW-2	RW-2
	Sample Date:	7/29/2009	8/12/2009	9/10/2009	11/10/2009	12/2/2009	2/2/2010
NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 100	< 100	< 50	< 25	< 25	< 25
1,1,2-Tetrachloroethane	5	< 100	< 100	< 50	< 25	< 25	< 25
1,1,2-Trichloroethane	1	< 100	< 100	< 50	< 25	< 25	< 25
1,1-Dichloroethane	5	9.2 J	8.8 J	6.4 J	5.2 J	5.3 J	3.5 J
1,1-Dichloroethene	5	< 100	< 100	< 50	2.9 J	3.1 J	< 25
1,2-Dichloroethane	0.6	< 100	< 100	< 50	< 25	< 25	< 25
1,2-Dichloropropane	1	< 100	< 100	< 50	< 25	< 25	< 25
2-Butanone	NE	< 1000	< 1000	< 500	< 250	< 250	< 250
2-Hexanone	50	< 1000	< 1000	< 500	< 250	< 250	< 250
4-methyl-2-pentanone	50	< 1000	< 1000	< 500	< 250	< 250	< 250
Acetone	NE	< 1000	< 1000	< 500	< 250	< 250	< 250
Benzene	1	< 14	< 14	< 7	< 3.5	< 3.5	< 3.5
Bromodichloromethane	50	< 100	< 100	< 50	< 25	< 25	< 25
Bromoform	50	< 100	< 100	< 50	< 25	< 25	< 25
Bromomethane	5	< 100	< 100	< 50	< 25	< 25 R	< 25
Carbon Disulfide	60	< 100	< 100	< 50	< 25	< 25	< 25
Carbon tetrachloride	5	< 100	< 100	< 50	< 25	< 25	< 25
Chlorobenzene	5	< 100	< 100	< 50	< 25	< 25	< 25
Chlorodifluoromethane (Freon 22)	NE	< 100	< 100	4 J	3.5 J	3.3 J	< 25
Chloroethane	5	< 100	< 100	< 50	< 25	< 25	< 25
Chloroform	7	< 100	< 100	3.4 J	3 J	2.3 J	2 J
Chloromethane	5	< 100	< 100	< 50	< 25	< 25 R	< 25
cis-1,2-dichloroethene	5	2,600	2,300	1,300	930	880	590
cis-1,3-dichloropropene	0.4	< 100	< 100	< 50	< 25	< 25	< 25
Dibromochloromethane	50	< 100	< 100	< 50	< 25	< 25	< 25
Dichlorodifluoromethane (Freon 12)	5	< 100	< 100	< 50	< 25	< 25	< 25
Ethylbenzene	5	13 J	7.2 J	4.8 J	6.4 J	5.1 J	1.8 J
Methyl tert-Butyl Ether	5	--	--	--	--	--	< 25
Methylene Chloride	5	< 100	< 100	< 50	< 25	< 25	1.2 J
Styrene	5	< 100	< 100	< 50	< 25	< 25	< 25
Tetrachloroethene	5	< 100	< 100	< 50	< 25	< 25	< 25
Toluene	5	520	170	190	200	150	49
trans-1,2-dichloroethene	5	12 J	21 J	32 J	6.2 J	2.1 J	49
trans-1,3-dichloropropene	0.4	< 100	< 100	< 50	< 25	< 25	< 25
Trichloroethylene	5	46 J	30 J	52	59	63	46
Trichlorofluoromethane (CFC-11)	5	--	--	--	--	--	< 25
Trichlorotrifluoroethane (Freon 113)	5	< 100	< 100	< 50	< 25	< 25	< 25
Vinyl Chloride	2	630	670	370	210	210	83
Xylene-o	5	14 J	9.4 J	5.4 J	6 J	4.9 J	< 25
Xylenes - m,p	5	27 J	9.2 J	7.9 J	11 J	9 J	< 25
Total VOCs⁽²⁾		3,871	3,226	1,976	1,443	1,338	824
Project VOCs⁽³⁾		3,849	3,210	1,957	1,430	1,327	821

See notes on last page.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location: Sample Date:	RW-2 4/12/2010	RW-2 (dup) 4/12/2010	RW-2 7/20/2010	RW-2 10/4/2010	RW-2 1/10/2011	RW-2 6/8/2011	RW-2 7/8/2011
NYSDEC SCGs								
1,1,1-Trichloroethane	5	< 13	< 13	< 13	< 13	0.78 J	1.1 J	0.93 J
1,1,2-Tetrachloroethane	5	< 13	< 13	< 13	< 13	< 13	< 5	< 13
1,1,2-Trichloroethane	1	< 13	< 13	< 13	< 13	< 13	< 5	< 13
1,1-Dichloroethane	5	3.2 J	3.6 J	2.3 J	2.2 J	3.5 J	3.1 J	2.4 J
1,1-Dichloroethene	5	3 J	3 J	2.1 J	2.2 J	4.9 J	2.8 J	2.7 J
1,2-Dichloroethane	0.6	< 13	< 13	< 13	< 13	< 13	< 5	< 13
1,2-Dichloropropane	1	< 13	< 13	< 13	< 13	< 13	0.38 J	< 13
2-Butanone	NE	< 130	< 130	< 130	< 130	< 130	< 50	< 130
2-Hexanone	50	< 130	< 130	< 130	< 130	< 130	< 50	< 130
4-methyl-2-pentanone	50	< 130	< 130	< 130	< 130	< 130	< 50	< 130
Acetone	NE	< 130	< 130	< 130	< 130 B	< 130 B	< 50	< 130
Benzene	1	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 0.7	< 1.8
Bromodichloromethane	50	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Bromoform	50	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Bromomethane	5	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Carbon Disulfide	60	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Carbon tetrachloride	5	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Chlorobenzene	5	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Chlorodifluoromethane (Freon 22)	NE	1.7 J	1.7 J	1.1 J	1 J	1.4 J	0.98 J	1.3 J
Chloroethane	5	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Chloroform	7	1.5 J	1.6 J	1.4 J	1.9 J	1.9 J	1.3 J	1.3 J
Chloromethane	5	< 13	< 13	< 13	< 13	< 13	< 5	< 13
cis-1,2-dichloroethene	5	480	440 D	310	270	460	300 D	320
cis-1,3-dichloropropene	0.4	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Dibromochloromethane	50	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Dichlorodifluoromethane (Freon 12)	5	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Ethylbenzene	5	2.2 J	2.1 J	1.7 J	1.5 J	2.6 J	1.7 J	2.4 J
Methyl tert-Butyl Ether	5	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Methylene Chloride	5	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Styrene	5	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Tetrachloroethene	5	< 13	< 13	< 13	< 13	< 13	0.43 J	< 13
Toluene	5	71	73	35	25	62	62	81
trans-1,2-dichloroethene	5	< 13	3.4 J	0.95 J	< 13	< 13	0.42 J	< 13
trans-1,3-dichloropropene	0.4	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Trichloroethylene	5	43	45	35	36	51	30	25
Trichlorofluoromethane (CFC-11)	5	< 13	< 13	< 13	< 13	< 13	< 5 U	< 13
Trichlorotrifluoroethane (Freon 113)	5	< 13	< 13	< 13	< 13	< 13	< 5	< 13
Vinyl Chloride	2	94	96	54	45	87	88	67
Xylene-o	5	2.2 J	2.3 J	1.3 J	0.9 J	2.6 J	2.6 J	2.6 J
Xylenes - m,p	5	3.5 J	3.4 J	2.4 J	1.9 J	3.8 J	4.5 J	4.6 J
Total VOCs⁽²⁾		705	675	447	388	681	499	511
Project VOCs⁽³⁾		699	670	443	383	676	495	506

See notes on last page.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location: Sample Date:	RW-2 10/3/2011	RW-2 1/9/2012	RW-2 4/3/2012	RW-2 (dup.) 4/3/2012	RW-2 7/2/2012	RW-2 10/1/2012	RW-2 1/7/2013
NYSDEC SCGs								
1,1,1-Trichloroethane	5	0.73 J	< 13 U	0.52 J	< 10 U	0.46 J	0.51 J	0.41 J
1,1,2-Tetrachloroethane	5	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
1,1,2-Trichloroethane	1	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
1,1-Dichloroethane	5	2.0 J	1.7 J	1.4 J	1.6 J	1.5 J	1.6 J	1.6 J
1,1-Dichloroethene	5	1.7 J	0.98 J	0.92 J	0.84 J	1.2 J	1 J	0.82 J
1,2-Dichloroethane	0.6	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
1,2-Dichloropropane	1	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	0.28 J	< 5 U
2-Butanone	NE	< 130 U	< 130 U	< 100 U	< 100 U	< 50 U	< 50 U	< 50 U
2-Hexanone	50	< 130 U	< 130 U	< 100 U	< 100 U	< 50 U	< 50 U	< 50 U
4-methyl-2-pentanone	50	< 130 U	< 130 U	< 100 U	< 100 U	< 50 U	< 50 U	< 50 U
Acetone	NE	< 130 UB	3.4 J	< 100 U	1.5 J	< 50 U	< 50 U	< 50 U
Benzene	1	< 1.8 U	< 1.8 U	< 1.4 U	< 1.4 U	< 0.7 U	< 0.7 U	< 0.7 U
Bromodichloromethane	50	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Bromoform	50	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Bromomethane	5	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Carbon Disulfide	60	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Carbon tetrachloride	5	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Chlorobenzene	5	< 13 U	< 13 U	< 10 U	< 10 U	0.22 J	< 5 U	< 5 U
Chlorodifluoromethane (Freon 22)	NE	0.60 J	0.95 J	0.64 J	0.48 J	0.44 J	0.4 J	0.33 J
Chloroethane	5	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Chloroform	7	1.1 J	1.4 J	1 J	1.1 J	1.4 J	1.9 J	2.1 J
Chloromethane	5	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
cis-1,2-dichloroethene	5	280	260	220	220	200	200	160
cis-1,3-dichloropropene	0.4	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Dibromochloromethane	50	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Dichlorodifluoromethane (Freon 12)	5	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Ethylbenzene	5	2.5 J	2.4 J	1.5 J	1.6 J	2.8 J	3.3 J	2.3 J
Methyl tert-Butyl Ether	5	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Methylene Chloride	5	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Styrene	5	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Tetrachloroethene	5	0.58 J	< 13 U	< 10 U	< 10 U	0.4 J	0.36 J	0.38 J
Toluene	5	72	81	60	61	73	96	82
trans-1,2-dichloroethene	5	0.63 J	< 13 U	0.46 J	< 10 U	0.87 J	0.26 J	< 5 U
trans-1,3-dichloropropene	0.4	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Trichloroethylene	5	25	23	18	18	20	20	18
Trichlorofluoromethane (CFC-11)	5	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Trichlorotrifluoroethane (Freon 113)	5	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5 U	< 5 U
Vinyl Chloride	2	55	59	54	54	44	61	75
Xylene-o	5	2.6 J	2.6 J	2.2 J	2.3 J	2.6 J	2.7 J	3.2 J
Xylenes - m,p	5	4.2 J	4.7 J	3.6 J	4.1 J	4.5 J	5.8	5.3
Total VOCs⁽²⁾		449	441	364	367	353	395	351
Project VOCs⁽³⁾		444	433	361	362	349	374	347

See notes on last page.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location: Sample Date:	RW-2 4/1/2013	RW-2 (dup.) 4/1/2013	RW-2 7/1/2013
NYSDEC SCGs				
1,1,1-Trichloroethane	5	0.39 J	0.37 J	0.27 J
1,1,2-Tetrachloroethane	5	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2-Trichloroethane	1	< 5.0 U	< 5.0 U	< 5.0 U
1,1-Dichloroethane	5	1.8 J	2.0 J	1.5 J
1,1-Dichloroethene	5	0.85 J	0.83 J	0.77 J
1,2-Dichloroethane	0.6	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloropropane	1	< 5.0 U	0.47 J	< 5.0 U
2-Butanone	NE	< 50 U	< 50 U	< 50 U
2-Hexanone	50	< 50 U	< 50 U	< 50 U
4-methyl-2-pentanone	50	< 50 U	< 50 U	< 50 U
Acetone	NE	< 50 U	< 50 U	< 50 U
Benzene	1	< 0.70 U	< 0.70 U	< 0.70 U
Bromodichloromethane	50	< 5.0 U	< 5.0 U	< 5.0 U
Bromoform	50	< 5.0 U	< 5.0 U	< 5.0 U
Bromomethane	5	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Disulfide	60	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	5	< 5.0 U	< 5.0 U	< 5.0 U
Chlorobenzene	5	< 5.0 U	< 5.0 U	< 5.0 U
Chlorodifluoromethane (Freon 22)	NE	< 5.0 U	< 5.0 U	< 5.0 U
Chloroethane	5	< 5.0 U	< 5.0 U	< 5.0 U
Chloroform	7	2.2 J	2.3 J	2.2 J
Chloromethane	5	< 5.0 U	< 5.0 U	< 5.0 U
cis-1,2-dichloroethene	5	170 D	180 D	140
cis-1,3-dichloropropene	0.4	< 5.0 U	< 5.0 U	< 5.0 U
Dibromochloromethane	50	< 5.0 U	< 5.0 U	< 5.0 U
Dichlorodifluoromethane (Freon 12)	5	< 5.0 U	< 5.0 U	< 5.0 U
Ethylbenzene	5	3.6 J	3.7 J	3.1 J
Methyl tert-Butyl Ether	5	< 5.0 U	< 5.0 U	< 5.0 U
Methylene Chloride	5	< 5.0 U	< 5.0 U	< 5.0 U
Styrene	5	< 5.0 U	< 5.0 U	< 5.0 U
Tetrachloroethene	5	0.34 J	0.36 J	0.33 J
Toluene	5	110	110	95
trans-1,2-dichloroethene	5	0.26 J	< 5.0 U	< 5.0 U
trans-1,3-dichloropropene	0.4	< 5.0 U	< 5.0 U	< 5.0 U
Trichloroethylene	5	16	16	17
Trichlorofluoromethane (CFC-11)	5	< 5.0 U	< 5.0 U	< 5.0 U
Trichlorotrifluoroethane (Freon 113)	5	< 5.0 U	< 5.0 U	< 5.0 U
Vinyl Chloride	2	110	110	100
Xylene-o	5	4.1 J	4.5 J	3.1 J
Xylenes - m,p	5	8.6	8.9	5.6
Total VOCs⁽²⁾		428	439	369
Project VOCs⁽³⁾		422	433	364

See notes on last page.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location: Sample Date:	RW-3 7/29/2009	RW-3 8/12/2009	RW-3 9/10/2009	RW-3 11/10/2009	RW-3 12/2/2009	RW-3 2/2/2010
NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 13	< 25
1,1,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 13	< 25
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 13	< 25
1,1-Dichloroethane	5	2.4 J	2.1 J	1.9 J	1.4 J	1.3 J	< 25
1,1-Dichloroethene	5	< 5	0.35 J	0.41 J	0.53 J	< 13	< 25
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 13	< 25
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 13	< 25
2-Butanone	NE	< 50	< 50	< 50	< 50	< 130	< 250
2-Hexanone	50	< 50	< 50	< 50	< 50	< 130	< 250
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 50	< 130	< 250
Acetone	NE	< 50	< 50	2 J	3.1 J	< 130	< 250
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 1.8	< 3.5
Bromodichloromethane	50	0.35 J	< 5	< 5	< 5	< 13	< 25
Bromoform	50	< 5	< 5	< 5	< 5	< 13	< 25
Bromomethane	5	< 5	< 5	< 5	< 5	< 13	< 25
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 13	< 25
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 13	< 25
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 13	< 25
Chlorodifluoromethane (Freon 22)	NE	2.1 J	8.5	93	490 D	660 D	1,300 D
Chloroethane	5	< 5	< 5	< 5	< 5	< 13	< 25
Chloroform	7	2.1 J	2.3 J	2.9 J	5.9	6 J	4.3 J
Chloromethane	5	< 5	< 5	< 5	< 5	< 13 R	< 25
cis-1,2-dichloroethene	5	130	120	130	85	72	68
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 13	< 25
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 13	< 25
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 13	< 25
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 13	< 25
Methyl tert-Butyl Ether	5	--	--	--	--	--	< 25
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 13	< 25
Styrene	5	< 5	< 5	< 5	< 5	< 13	< 25
Tetrachloroethene	5	0.81 J	0.56 J	0.83 J	0.54 J	< 13	< 25
Toluene	5	< 5	< 5	< 5	< 5	< 13	< 25
trans-1,2-dichloroethene	5	0.68 J	0.54 J	0.59 J	0.52 J	< 13	7.2 J
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 13	< 25
Trichloroethylene	5	37	34	29	24	22	19 J
Trichlorofluoromethane (CFC-11)	5	--	--	--	--	--	< 25
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 13	< 25
Vinyl Chloride	2	< 2	< 2	0.47 J	0.42 J	< 5	< 10
Xylene-o	5	< 5	< 5	< 5	< 5	< 13	< 25
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 13	< 25
Total VOCs⁽²⁾		175	168	261	611	761	1,399
Project VOCs⁽³⁾		171	158	163	112	95	94

See notes on last page.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location: Sample Date:	RW-3 4/12/2010	RW-3 7/20/2010	RW-3 10/4/2010	RW-3 1/10/2011	RW-3 4/8/2011	RW-3 7/8/2011
NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 25	< 50	< 25	< 25	< 25	< 25
1,1,2-Tetrachloroethane	5	< 25	< 50	< 25	< 25	< 25	< 25
1,1,2-Trichloroethane	1	< 25	< 50	< 25	< 25	< 25	< 25
1,1-Dichloroethane	5	< 25	< 50	< 25	< 25	< 25	< 25
1,1-Dichloroethene	5	< 25	< 50	< 25	< 25	< 25	< 25
1,2-Dichloroethane	0.6	< 25	< 50	< 25	< 25	< 25	< 25
1,2-Dichloropropane	1	< 25	< 50	< 25	< 25	< 25	< 25
2-Butanone	NE	< 250	< 500	< 250	< 250	< 250	< 250
2-Hexanone	50	< 250	< 500	< 250	< 250	< 250	< 250
4-methyl-2-pentanone	50	< 250	< 500	< 250	< 250	< 250	< 250
Acetone	NE	< 250	< 500	< 250	< 250 B	< 250	< 250
Benzene	1	< 3.5	< 7	< 3.5	< 3.5	< 3.5	< 3.5
Bromodichloromethane	50	< 25	< 50	< 25	< 25	< 25	< 25
Bromoform	50	< 25	< 50	< 25	< 25	< 25	< 25
Bromomethane	5	< 25	< 50	< 25	< 25	< 25	< 25
Carbon Disulfide	60	< 25	< 50	< 25	< 25	< 25	< 25
Carbon tetrachloride	5	< 25	< 50	< 25	< 25	< 25	< 25
Chlorobenzene	5	< 25	< 50	< 25	< 25	< 25	< 25
Chlorodifluoromethane (Freon 22)	NE	1,300 D	1400	880	890	900	670
Chloroethane	5	< 25	< 50	< 25	< 25	< 25	< 25
Chloroform	7	3.2 J	< 50	6.6 J	5.8 J	4.0 J	2.5 J
Chloromethane	5	< 25	< 50	< 25	< 25	< 25	< 25
cis-1,2-dichloroethene	5	70	64	64	74	93	110
cis-1,3-dichloropropene	0.4	< 25	< 50	< 25	< 25	< 25	< 25
Dibromochloromethane	50	< 25	< 50	< 25	< 25	< 25	< 25
Dichlorodifluoromethane (Freon 12)	5	< 25	< 50	< 25	< 25	< 25	< 25
Ethylbenzene	5	< 25	< 50	< 25	< 25	< 25	< 25
Methyl tert-Butyl Ether	5	< 25	< 50	< 25	< 25	< 25	< 25
Methylene Chloride	5	< 25	< 50	< 25	< 25	< 25	< 25
Styrene	5	< 25	< 50	< 25	< 25	< 25	< 25
Tetrachloroethene	5	< 25	< 50	< 25	< 25	< 25	< 25
Toluene	5	< 25	< 50	< 25	< 25	< 25	< 25
trans-1,2-dichloroethene	5	< 25	4.8 J	6.7 J	3.9 J	6.5 J	< 25
trans-1,3-dichloropropene	0.4	< 25	< 50	< 25	< 25	< 25	< 25
Trichloroethylene	5	17 J	14 J	12 J	10 J	6.8 J	7.7 J
Trichlorofluoromethane (CFC-11)	5	< 25	< 50	< 25	< 25	< 25	< 25
Trichlorotrifluoroethane (Freon 113)	5	< 25	< 50	< 25	< 25	< 25	< 25
Vinyl Chloride	2	< 10	< 20	2.6 J	5.1 J	11	9.9 J
Xylene-o	5	< 25	< 50	< 25	< 25	< 25	< 25
Xylenes - m,p	5	< 25	< 50	< 25	< 25	< 25	< 25
Total VOCs⁽²⁾		1,390	1,483	972	989	1,021	800
Project VOCs⁽³⁾		87	83	85	93	117	128

See notes on last page.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location: Sample Date:	RW-3 10/3/2011	RW-3 1/9/2012	RW-3 4/3/2012	RW-3 7/2/2012	RW-3 10/1/2012	RW-3 1/7/2013	RW-3 4/1/2013	RW-3 7/1/2013
NYSDEC SCGs									
1,1,1-Trichloroethane	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
1,1,2-Tetrachloroethane	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
1,1,2-Trichloroethane	1	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
1,1-Dichloroethane	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	0.21 J	< 5.0 U	0.21 J
1,1-Dichloroethene	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
1,2-Dichloroethane	0.6	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
1,2-Dichloropropane	1	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
2-Butanone	NE	< 250 U	< 130 U	< 130 U	< 100 U	< 100 U	< 50 U	< 50 U	< 50 U
2-Hexanone	50	< 250 U	< 130 U	< 130 U	< 100 U	< 100 U	< 50 U	< 50 U	< 50 U
4-methyl-2-pentanone	50	< 250 U	< 130 U	< 130 U	< 100 U	< 100 U	< 50 U	< 50 U	< 50 U
Acetone	NE	< 250 U	< 130 U	< 130 U	< 100 UB	< 100 U	< 50 U	< 50 U	< 50 U
Benzene	1	< 3.5 U	< 1.8 U	< 1.8 U	< 1.4 U	< 1.4 U	< 0.7 U	< 0.70 U	< 0.70 U
Bromodichloromethane	50	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Bromoform	50	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Bromomethane	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Carbon Disulfide	60	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Chlorobenzene	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Chlorodifluoromethane (Freon 22)	NE	540	390	460	270	230	190	130	98
Chloroethane	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Chloroform	7	5.5 J	6.9 J	3.4 J	2.9 J	5.3 J	4.9 J	3.5 J	3.6 J
Chloromethane	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
cis-1,2-dichloroethene	5	92	55	33	22	17	12	9.4	7.7
cis-1,3-dichloropropene	0.4	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Dibromochloromethane	50	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Dichlorodifluoromethane (Freon 12)	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Ethylbenzene	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Methyl tert-Butyl Ether	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Methylene Chloride	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Styrene	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Tetrachloroethene	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	0.33 J	0.29 J	0.38 J
Toluene	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
trans-1,2-dichloroethene	5	1.8 J	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
trans-1,3-dichloropropene	0.4	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Trichloroethylene	5	7.5 J	6.7 J	6 J	6.5 J	5.3 J	5.1	4.3 J	4.5 J
Trichlorofluoromethane (CFC-11)	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Trichlorotrifluoroethane (Freon 113)	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	0.30 J
Vinyl Chloride	2	7.1 J	2.8 J	1.2 J	0.8 J	0.48 J	0.25 J	0.24 J	< 2.0 U
Xylene-o	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Xylenes - m,p	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U	< 5.0 U	< 5.0 U
Total VOCs⁽²⁾		654	461	504	302	258	213	148	115
Project VOCs⁽³⁾		108	65	40	29	23	18	14	13

See notes on last page.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location: Sample Date:	RW-4 7/29/2009	RW-4 8/12/2009	RW-4 9/10/2009	RW-4 11/10/2009	RW-4 12/2/2009	RW-4 2/2/2010
NYSDEC <u>SCGs</u>							
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 10	< 10
1,1,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 10	< 10
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 10	< 10
1,1-Dichloroethane	5	0.42 J	0.38 J	0.47 J	0.52 J	< 10	0.6 J
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 10	< 10
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 10	< 10
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 10	< 10
2-Butanone	NE	< 50	< 50	< 50	< 50	< 100	< 100
2-Hexanone	50	< 50	< 50	< 50	< 50	< 100	< 100
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 50	< 100	< 100
Acetone	NE	< 50	< 50	< 50	3.5 J	< 100	< 100
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 1.4	< 1.4
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 10	< 10
Bromoform	50	< 5	< 5	< 5	< 5	< 10	< 10
Bromomethane	5	< 5	< 5	< 5	< 5	< 10 R	< 10
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 10	< 10
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 10	< 10
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 10	< 10
Chlorodifluoromethane (Freon 22)	NE	140	200	330 D	230 D	290	440 D
Chloroethane	5	< 5	< 5	< 5	< 5	< 10	< 10
Chloroform	7	1 J	0.88 J	0.78 J	0.95 J	0.88 J	0.72 J
Chloromethane	5	< 5	< 5	< 5	< 5	< 10 R	< 10
cis-1,2-dichloroethene	5	1.5 J	1.7 J	1.9 J	1.9 J	2.2 J	1.8 J
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 10	< 10
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 10	< 10
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 10	< 10
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 10	< 10
Methyl tert-Butyl Ether	5	--	--	--	--	--	< 10
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 10	< 10
Styrene	5	< 5	< 5	< 5	< 5	< 10	< 10
Tetrachloroethene	5	0.44 J	0.44 J	0.44 J	0.48 J	< 10	0.64 J
Toluene	5	< 5	< 5	< 5	< 5	< 10	< 10
trans-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	< 10	< 10
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 10	< 10
Trichloroethylene	5	1.1 J	1.2 J	1.6 J	1.9 J	1.8 J	1.4 J
Trichlorofluoromethane (CFC-11)	5	--	--	--	--	--	< 10
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 10	< 10
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 4	< 4
Xylene-o	5	< 5	< 5	< 5	< 5	< 10	< 10
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 10	< 10
Total VOCs⁽²⁾		144	205	335	239	295	445
Project VOCs⁽³⁾		3.5	3.7	4.4	4.8	4.0	4.4

See notes on last page.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location: Sample Date:	RW-4 4/12/2010	RW-4 7/20/2010	RW-4 10/4/2010	RW-4 1/10/2011	RW-4 4/8/2011	RW-4 7/8/2011
NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 13	< 25	< 25	< 25	< 25	< 25
1,1,2-Tetrachloroethane	5	< 13	< 25	< 25	< 25	< 25	< 25
1,1,2-Trichloroethane	1	< 13	< 25	< 25	< 25	< 25	< 25
1,1-Dichloroethane	5	< 13	< 25	< 25	< 25	< 25	< 25
1,1-Dichloroethene	5	< 13	< 25	< 25	< 25	< 25	< 25
1,2-Dichloroethane	0.6	< 13	< 25	< 25	< 25	< 25	< 25
1,2-Dichloropropane	1	< 13	< 25	< 25	< 25	< 25	< 25
2-Butanone	NE	< 130	< 250	< 250	< 250	< 250	< 250
2-Hexanone	50	< 130	< 250	< 250	< 250	< 250	< 250
4-methyl-2-pentanone	50	< 130	< 250	< 250	< 250	< 250	< 250
Acetone	NE	< 130	< 250	< 250	< 250	< 250	< 250
Benzene	1	< 1.8	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5
Bromodichloromethane	50	< 13	< 25	< 25	< 25	< 25	< 25
Bromoform	50	< 13	< 25	< 25	< 25	< 25	< 25
Bromomethane	5	< 13	< 25	< 25	< 25	< 25	< 25
Carbon Disulfide	60	< 13	< 25	< 25	< 25	< 25	< 25
Carbon tetrachloride	5	< 13	< 25	< 25	< 25	< 25	< 25
Chlorobenzene	5	< 13	< 25	< 25	< 25	< 25	< 25
Chlorodifluoromethane (Freon 22)	NE	560 D	840	850	820	650	520
Chloroethane	5	< 13	< 25	< 25	< 25	< 25	< 25
Chloroform	7	0.8 J	< 25	< 25	< 25	< 25	< 25
Chloromethane	5	< 13	< 25	< 25	< 25	< 25	< 25
cis-1,2-dichloroethene	5	1.5 J	< 25	< 25	< 25	< 25	< 25
cis-1,3-dichloropropene	0.4	< 13	< 25	< 25	< 25	< 25	< 25
Dibromochloromethane	50	< 13	< 25	< 25	< 25	< 25	< 25
Dichlorodifluoromethane (Freon 12)	5	< 13	< 25	< 25	< 25	< 25	< 25
Ethylbenzene	5	< 13	< 25	< 25	< 25	< 25	< 25
Methyl tert-Butyl Ether	5	< 13	< 25	< 25	< 25	< 25	< 25
Methylene Chloride	5	< 13	< 25	< 25	< 25	< 25	< 25
Styrene	5	< 13	< 25	< 25	< 25	< 25	< 25
Tetrachloroethene	5	0.9 J	< 25	< 25	< 25	< 25	< 25
Toluene	5	< 13	< 25	< 25	< 25	< 25	< 25
trans-1,2-dichloroethene	5	< 13	< 25	< 25	< 25	< 25	< 25
trans-1,3-dichloropropene	0.4	< 13	< 25	< 25	< 25	< 25	< 25
Trichloroethylene	5	1.4 J	< 25	< 25	< 25	< 25	< 25
Trichlorofluoromethane (CFC-11)	5	< 13	< 25	< 25	< 25	< 25	< 25
Trichlorotrifluoroethane (Freon 113)	5	< 13	< 25	< 25	< 25	< 25	< 25
Vinyl Chloride	2	< 5	< 10	< 10	< 10	< 10	< 10
Xylene-o	5	< 13	< 25	< 25	< 25	< 25	< 25
Xylenes - m,p	5	< 13	< 25	< 25	< 25	< 25	< 25
Total VOCs⁽²⁾		565	840	850	820	650	520
Project VOCs⁽³⁾		3.8	0.0	0.0	0.0	0.0	0.0

See notes on last page.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location: RW-4	RW-4 Sample Date: 4/1/2013	RW-4 7/1/2013
NYSDEC <u>SCGs</u>			
1,1,1-Trichloroethane	5	< 5.0 U	< 5.0 U
1,1,2-Tetrachloroethane	5	< 5.0 U	< 5.0 U
1,1,2-Trichloroethane	1	< 5.0 U	< 5.0 U
1,1-Dichloroethane	5	0.52 J	0.45 J
1,1-Dichloroethene	5	0.22 J	< 5.0 U
1,2-Dichloroethane	0.6	< 5.0 U	< 5.0 U
1,2-Dichloropropane	1	< 5.0 U	< 5.0 U
2-Butanone	NE	< 50 U	< 50 U
2-Hexanone	50	< 50 U	< 50 U
4-methyl-2-pentanone	50	< 50 U	< 50 U
Acetone	NE	< 50 U	< 50 U
Benzene	1	< 0.70 U	< 0.70 U
Bromodichloromethane	50	< 5.0 U	< 5.0 U
Bromoform	50	< 5.0 U	< 5.0 U
Bromomethane	5	< 5.0 U	< 5.0 U
Carbon Disulfide	60	< 5.0 U	< 5.0 U
Carbon tetrachloride	5	< 5.0 U	< 5.0 U
Chlorobenzene	5	< 5.0 U	< 5.0 U
Chlorodifluoromethane (Freon 22)	NE	140	110
Chloroethane	5	< 5.0 U	< 5.0 U
Chloroform	7	0.25 J	0.36 J
Chloromethane	5	< 5.0 U	< 5.0 U
cis-1,2-dichloroethene	5	0.29 J	< 5.0 U
cis-1,3-dichloropropene	0.4	< 5.0 U	< 5.0 U
Dibromochloromethane	50	< 5.0 U	< 5.0 U
Dichlorodifluoromethane (Freon 12)	5	< 5.0 U	< 5.0 U
Ethylbenzene	5	< 5.0 U	< 5.0 U
Methyl tert-Butyl Ether	5	< 5.0 U	0.30 J
Methylene Chloride	5	< 5.0 U	< 5.0 U
Styrene	5	< 5.0 U	< 5.0 U
Tetrachloroethene	5	1.3 J	1.1 J
Toluene	5	< 5.0 U	< 5.0 U
trans-1,2-dichloroethene	5	< 5.0 U	< 5.0 U
trans-1,3-dichloropropene	0.4	< 5.0 U	< 5.0 U
Trichloroethylene	5	0.75 J	0.67 J
Trichlorofluoromethane (CFC-11)	5	< 5.0 U	< 5.0 U
Trichlorotrifluoroethane (Freon 113)	5	0.33 J	0.39 J
Vinyl Chloride	2	< 2.0 U	< 2.0 U
Xylene-o	5	< 5.0 U	< 5.0 U
Xylenes - m,p	5	< 5.0 U	< 5.0 U
Total VOCs⁽²⁾		144	113
Project VOCs⁽³⁾		3.1	2.2

See notes on last page.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

Notes:

- (1) Water samples collected by ARCADIS on the dates shown and submitted to Columbia Analytical Services, Inc. through December 2012 and to ALS Environmental from January 2013 through the current reporting period for VOC analysis using NYSDEC ASP 2005 Method OLM4.3. Results validated following protocols specified in Sampling and Analysis Plan in the December 2009 DRAFT OM&M Manual (ARCADIS 2009).
- (2) "Total VOCs" represents the sum of individual concentrations of the VOCs detected.
- (3) "Project VOCs" represents the sum of individual compound concentrations of 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,2-Dichloroethane; 1,1-Dichloroethene; Tetrachloroethene; Trichloroethene; Vinyl Chloride; cis-1,2-Dichloroethene; trans-1,2-Dichloroethene; Benzene; Toluene; and Xylenes-o,m, and p.

Acronyms\Key:

	Indicates an exceedance of an SCG.
700	Bold data indicates that the analyte was detected at or above its reporting limit.
ASP	Analytical services protocol.
B	Compound detected in associated blank sample.
D	Constituent identified from secondary dilution.
J	Value is estimated.
NE	Not established.
NYSDEC	New York State Department of Environmental Conservation.
R	Concentration for the constituent was rejected.
SCGs	Standards, criteria, and guidance values.
VOC	Volatile organic compound.
ug/L	Micrograms per liter.
UB	Compound considered non-detect due to associated blank contamination.
< 5; <5 U	Compound not detected above its laboratory quantification limit.
--	Not analyzed.

Table 10. Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	
	Sample Date:	4/21/2009	7/29/2009	8/12/2009	9/10/2009	11/10/2009	12/2/2009	10/4/2010	2/10/2011	10/3/2011	11/11/2011
<u>NYSDEC SCGs</u>											
Total Cadmium	5	< 5	--	--	--	--	--	< 5	--	--	< 5
Dissolved Cadmium	5	< 5	--	--	--	--	--	< 5	--	--	< 5
Total Chromium	50	24.3	--	--	--	--	--	27	--	--	23
Dissolved Chromium	50	20.2	--	--	--	--	--	27	--	--	24
Total Iron	300	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	--
Dissolved Iron	300	< 100	--	--	--	--	--	< 100	< 100	< 100	--
Total Manganese	300	23.6	--	--	--	--	--	12	--	--	--
Dissolved Manganese	300	22.4	--	--	--	--	--	11	--	--	--
Total Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--

See notes on last page.

Table 10. Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-1 ⁽²⁾	RW-1	RW-1	RW-1
	Sample Date:	10/1/2012	1/7/2013	4/1/2013	7/1/2013
<u>NYSDEC SCGs</u>					
Total Cadmium	5	< 5	--	--	--
Dissolved Cadmium	5	< 5	--	--	--
Total Chromium	50	23	--	--	--
Dissolved Chromium	50	23	--	--	--
Total Iron	300	< 100	--	--	--
Dissolved Iron	300	< 100	--	--	--
Total Manganese	300	--	--	--	--
Dissolved Manganese	300	--	--	--	--
Total Mercury	0.7	--	--	--	--
Dissolved Mercury	0.7	--	--	--	--

See notes on last page.

Table 10. Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-2									
	Sample Date:	4/21/2009	7/29/2009	8/12/2009	9/10/2009	10/9/2009	11/10/2009	12/2/2009	1/11/2010	2/2/2010	3/10/2010
<u>NYSDEC SCGs</u>											
Total Cadmium	5	< 5	--	--	--	--	--	--	--	--	
Dissolved Cadmium	5	< 5	--	--	--	--	--	--	--	--	
Total Chromium	50	< 10	--	--	--	--	--	--	--	--	
Dissolved Chromium	50	< 10	--	--	--	--	--	--	--	--	
Total Iron	300	2,330	5,950	4,870	3,550	3,800	2,040	1,260	1,140	1,000	2,550
Dissolved Iron	300	781	--	--	--	--	--	--	--	--	
Total Manganese	300	241	--	--	--	--	--	--	--	--	
Dissolved Manganese	300	248	--	--	--	--	--	--	--	--	
Total Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	
Dissolved Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	

See notes on last page.

Table 10. Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-2	RW-2	RW-2	RW-2	RW-2	RW-2	RW-2	RW-2	RW-2	
	Sample Date:	4/12/2010	7/20/2010	10/4/2010	12/6/2010	2/10/2011	2/10/2011	3/7/2011	5/2/2011	6/8/2011	7/8/2011
<u>NYSDEC SCGs</u>											
Total Cadmium	5	--	--	< 5	--	--	--	--	--	--	
Dissolved Cadmium	5	--	--	< 5	--	--	--	--	--	--	
Total Chromium	50	--	--	< 10	--	--	--	--	--	--	
Dissolved Chromium	50	--	--	< 10	--	--	--	--	--	--	
Total Iron	300	880	1,180	710	590	970	970	850	890	830	3,110
Dissolved Iron	300	--	--	380	270	550	550	530	710	670	670
Total Manganese	300	--	--	187	--	--	--	--	--	--	
Dissolved Manganese	300	--	--	192	--	--	--	--	--	--	
Total Mercury	0.7	--	--	--	--	--	--	--	--	--	
Dissolved Mercury	0.7	--	--	--	--	--	--	--	--	--	

See notes on last page.

Table 10. Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-2	RW-2	RW-2	RW-2	RW-2	RW-2	RW-2	RW-2	RW-2	
	Sample Date:	8/1/2011	9/6/2011	10/3/2011	11/11/2011	12/19/2011	1/9/2012	2/6/2012	3/8/2012	4/3/2012	5/7/2012
<u>NYSDEC SCGs</u>											
Total Cadmium	5	--	--	--	< 5	--	--	--	--	< 5	
Dissolved Cadmium	5	--	--	--	< 5	--	--	--	--	< 5	
Total Chromium	50	--	--	--	< 10	--	--	--	--	< 10	
Dissolved Chromium	50	--	--	--	< 10	--	--	--	--	< 10	
Total Iron	300	840	830	1,640	750	930	870	960	990	930	970
Dissolved Iron	300	670	650	640	540	750	700	640	640	830	730
Total Manganese	300	--	--	--	--	--	--	--	--	--	
Dissolved Manganese	300	--	--	--	--	--	--	--	--	--	
Total Mercury	0.7	--	--	--	--	--	--	--	--	--	
Dissolved Mercury	0.7	--	--	--	--	--	--	--	--	--	

See notes on last page.

Table 10. Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-2	RW-2	RW-2	RW-2	RW-2	RW-2	RW-2	RW-2	RW-2 ⁽³⁾
	Sample Date:	6/5/2012	7/2/2012	8/7/2012	9/4/2012	10/1/2012	11/12/2012	12/3/2012	1/7/2013	2/4/2013
<u>NYSDEC SCGs</u>										
Total Cadmium	5	--	--	--	--	< 5	--	--	--	--
Dissolved Cadmium	5	--	--	--	--	< 5	--	--	--	--
Total Chromium	50	--	--	--	--	< 10	--	--	--	--
Dissolved Chromium	50	--	--	--	--	< 10	--	--	--	--
Total Iron	300	800	940	1,850	950	1,020	750	670	600	640
Dissolved Iron	300	690	840	780	810	780	610	540	560	520
										1,950
Total Manganese	300	--	--	--	--	--	--	--	--	--
Dissolved Manganese	300	--	--	--	--	--	--	--	--	--
Total Mercury	0.7	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	--	--	--	--	--	--	--	--	--

See notes on last page.

Table 10. Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-2	RW-2	RW-2	RW-2
	Sample Date:	4/1/2013	5/6/2013	6/6/2013	7/1/2013
NYSDEC <u>SCGs</u>					
Total Cadmium	5	--	--	--	--
Dissolved Cadmium	5	--	--	--	--
Total Chromium	50	--	--	--	--
Dissolved Chromium	50	--	--	--	--
Total Iron	300	1,070	700	990	1,200
Dissolved Iron	300	720	600	740	650
Total Manganese	300	--	--	--	--
Dissolved Manganese	300	--	--	--	--
Total Mercury	0.7	--	--	--	--
Dissolved Mercury	0.7	--	--	--	--

See notes on last page.

Table 10. Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-3	RW-3	RW-3	RW-3	RW-3	RW-3	RW-3	RW-3	RW-3	
	Sample Date:	4/22/2009	7/29/2009	9/10/2009	11/10/2009	12/2/2009	3/10/2010	4/12/2010	7/20/2010	10/4/2010	12/6/2010
<u>NYSDEC SCGs</u>											
Total Cadmium	5	< 5	--	--	--	--	--	--	--	< 5	--
Dissolved Cadmium	5	< 5	--	--	--	--	--	--	--	< 5	--
Total Chromium	50	22.6	--	--	--	--	--	--	--	< 10	--
Dissolved Chromium	50	< 10	--	--	--	--	--	--	--	< 10	--
Total Iron	300	246	< 100	< 100	< 100	< 100	200	470	890	350	340
Dissolved Iron	300	< 100	--	--	--	--	--	--	--	< 100	150
Total Manganese	300	< 10	--	--	--	--	--	--	--	35	--
Dissolved Manganese	300	< 10	--	--	--	--	--	--	--	34	--
Total Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--

See notes on last page.

Table 10. Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-3	RW-3	RW-3							
	Sample Date:	3/7/2011	4/8/2011	5/2/2011	6/8/2011	7/8/2011	8/1/2011	9/6/2011	10/3/2011	11/11/2011	12/19/2011
<u>NYSDEC SCGs</u>											
Total Cadmium	5	--	--	--	--	--	--	--	< 5	--	
Dissolved Cadmium	5	--	--	--	--	--	--	--	< 5	--	
Total Chromium	50	--	--	--	--	--	--	--	< 10	--	
Dissolved Chromium	50	--	--	--	--	--	--	--	< 10	--	
Total Iron	300	530	480	480	570	450	450	370	460	460	280
Dissolved Iron	300	200	200	130	140	120	120	< 100	110	< 100	200
Total Manganese	300	--	--	--	--	--	--	--	--	--	--
Dissolved Manganese	300	--	--	--	--	--	--	--	--	--	--
Total Mercury	0.7	--	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	--	--	--	--	--	--	--	--	--	--

See notes on last page.

Table 10. Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-3									
	Sample Date:	1/9/2012	2/6/2012	3/8/2012	4/3/2012	5/7/2012	6/5/2012	7/2/2012	8/7/2012	9/4/2012	10/1/2012
<u>NYSDEC SCGs</u>											
Total Cadmium	5	--	--	--	--	< 5	--	--	--	--	< 5
Dissolved Cadmium	5	--	--	--	--	< 5	--	--	--	--	< 5
Total Chromium	50	--	--	--	--	< 10	--	--	--	--	< 10
Dissolved Chromium	50	--	--	--	--	< 10	--	--	--	--	< 10
Total Iron	300	500	410	980	310	400	140	250	310	140	280
Dissolved Iron	300	110	100	130	110	< 100	120	110	120	< 100	< 100
Total Manganese	300	--	--	--	--	--	--	--	--	--	--
Dissolved Manganese	300	--	--	--	--	--	--	--	--	--	--
Total Mercury	0.7	--	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	--	--	--	--	--	--	--	--	--	--

See notes on last page.

Table 10. Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-3	RW-3	RW-3	RW-3	RW-3	RW-3	RW-3	RW-3
	Sample Date:	11/12/2012	12/3/2012	1/7/2013	2/4/2013	3/4/2013	4/1/2013	5/6/2013	6/6/2013
<u>NYSDEC SCGs</u>									
Total Cadmium	5	--	--	--	--	--	--	--	--
Dissolved Cadmium	5	--	--	--	--	--	--	--	--
Total Chromium	50	--	--	--	--	--	--	--	--
Dissolved Chromium	50	--	--	--	--	--	--	--	--
Total Iron	300	220	210	< 100	290	130	230	330	280
Dissolved Iron	300	100	< 100	< 100	110	130	110	< 100	140
Total Manganese	300	--	--	--	--	--	--	--	--
Dissolved Manganese	300	--	--	--	--	--	--	--	--
Total Mercury	0.7	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	--	--	--	--	--	--	--	--

See notes on last page.

Table 10. Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-4	RW-4	RW-4	RW-4	RW-4	RW-4	RW-4	RW-4	RW-4	RW-4 ⁽²⁾
	Sample Date:	4/22/2009	7/29/2009	8/12/2009	9/10/2009	11/10/2009	12/2/2009	10/4/2010	10/3/2011	11/11/2011	10/1/2012
<u>NYSDEC SCGs</u>											
Total Cadmium	5	< 5	--	--	--	--	--	< 5	--	< 5	< 5
Dissolved Cadmium	5	< 5	--	--	--	--	--	< 5	--	< 5	< 5
Total Chromium	50	< 10	--	--	--	--	--	< 10	--	< 10	< 10
Dissolved Chromium	50	< 10	--	--	--	--	--	< 10	--	< 10	< 10
Total Iron	300	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Dissolved Iron	300	< 100	--	--	--	--	--	< 100	< 100	< 100	< 100
Total Manganese	300	10.4	--	--	--	--	--	28	--	--	--
Dissolved Manganese	300	< 10	--	--	--	--	--	29	--	--	--
Total Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--

See notes on last page.

Table 10. Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.⁽¹⁾

COMPOUND (ug/L)	Sample Location:	RW-4	RW-4	RW-4
	Sample Date:	1/7/2013	4/1/2013	7/1/2013
NYSDEC <u>SCGs</u>				
Total Cadmium	5	--	--	--
Dissolved Cadmium	5	--	--	--
Total Chromium	50	--	--	--
Dissolved Chromium	50	--	--	--
Total Iron	300	--	--	--
Dissolved Iron	300	--	--	--
Total Manganese	300	--	--	--
Dissolved Manganese	300	--	--	--
Total Mercury	0.7	--	--	--
Dissolved Mercury	0.7	--	--	--

Notes:

- (1) Water samples collected by ARCADIS on the dates shown and submitted to Columbia Analytical Services, Inc. for metals analysis using USEPA Method 6010 and for mercury analyses using USEPA Method 7470.. Results validated following protocols specified in Sampling and Analysis Plan in the December 2009 DRAFT OM&M Manual (ARCADIS 2009).
- (2) Beginning January 2012 metals analyses for recovery wells RW-1 and RW-4 are included with annual recovery well sampling performed in October of each year.
- (3) Elevated RW-2 iron concentrations are believed attributed to multiple system shutdowns and re-starts due to a fouled pressure switch on March 2 and March 3, 2013. Turbulence dislodged accumulated iron deposits at the remedial well piping.

Acronyms/Key:

	Indicates an exceedance of an SCG.	SCGs	Standards, criteria, and guidance values.
700	Bold data indicates that the analyte was detected at or above its reporting limit.	ug/L	Micrograms per liter.
NYSDEC	New York State Department of Environmental Conservation.	--	Not analyzed.
ASP	Analytical services protocol.	< 5	Compound not detected above its laboratory quantification limit.

Table 11. Summary of Water-Level Elevations, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Well Identification	Well Casing Elevation (ft msl)	Event Date	Baseline (1) 5/8/2009 (ft msl)	1Q2010 02/04/10 (ft msl)	2Q2010 04/23/10 (ft msl)	3Q2010 08/26/10 (ft msl)	4Q2010 12/10/10 (ft msl)	1Q2011 02/04/11 (ft msl)	2Q2011 05/20/11 (ft msl)	3Q2011 08/09/11 (ft msl)	4Q2011 10/26/11 (ft msl)	1Q2012 01/25/12 (ft msl)	2Q2012 05/02/12 (ft msl)	3Q2012 08/17/12 (ft msl)	4Q2012 10/05/12 (ft msl)	1Q2013 02/13/13 (ft msl)	2Q2013 05/13/13 (ft msl)	3Q2013 08/13/13 (ft msl)
Recovery Wells																		
RW-1	125.18		69.75	70.67	74.38	72.52	71.11	70.96	72.13	70.44	72.72	73.15	72.12	71.71	71.21	70.35	70.89	71.62
RW-2	124.48		72.27	61.80	64.88	63.44	61.35	67.99	66.31	64.18	65.11	69.05	69.81	65.3	63.7	62.66	63.33	61.35
RW-3	122.84		69.40	67.64	71.4	69.44*	68.13	67.74	68.88	67.64	69.70	70.75	71.74	74.35 ⁽²⁾	68.06	68.01	68.73	72.29
RW-4	121.25		69.25	70.35	74.02	71.93	70.56	67.06	71.37	69.95	72.13	72.71	71.61	70.88	70.67	69.7	70.37	71.2
Monitoring Wells																		
B24MW-2	126.96		74.31	74.13	76.16	75.86	75.65	74.96	76.06	74.35	76.00	76.28	75.57	75.76	74.63	74.85	74.32	73.81
B24MW-3	127.11		72.63	72.16	75.87	74.10	72.89	72.40	74.04	72.27	74.44	74.63	73.67	73.62	72.69	72.2	72.41	73.14
B30MW-1	128.33		73.55	73.00	76.54	74.96	73.86	73.38	74.75	73.25	75.41	75.54	74.66	NM	73.66	73.11	73.28	73.97
BCPMW-1	125.73		73.16	72.67	76.26	74.66	73.43	72.94	74.75	72.94	75.05	75.23	74.29	74.22	73.27	NM	73.09	73.51
BCPMW-2	126.39		72.55	71.83	75.52	73.69	72.55	72.03	73.64	71.94	74.16	74.33	73.29	73.17	72.39	71.82	72.09	72.66
BCPMW-3	124.94		72.46	71.59	75.24	73.40	72.27	71.74	73.25	71.64	73.94	74.05	73.06	72.85	72.14	71.56	71.79	72.44
BCPMW-4-1	128.76		72.30	71.33	75.05	73.13	72.02	71.56	73.08	71.46	73.70	73.78	72.81	72.59	71.89	71.41	71.56	72.32
BCPMW-4-2	129.15		72.58	71.36	75.07	73.16	72.08	71.56	73.06	71.51	73.74	73.83	72.83	72.61	71.92	71.42	71.58	72.31
BCPMW-4-3	129.19		72.32	71.46	75.16	73.26	72.14	71.73	73.19	71.55	73.84	73.96	72.94	72.71	71.97	71.53	71.67	72.43
BCPMW-5-1	129.37		72.79	72.14	75.66	73.94	72.72	72.74	73.81	72.14	74.46	74.77	73.67	73.34	72.62	72.06	72.19	72.87
BCPMW-6-1	126.01		72.12	71.26	74.91	72.96	71.91	71.49	72.77	71.45	73.58	73.67	72.66	72.32	71.73	71.12	71.32	72.15
BCPMW-6-2	125.16		71.74	70.96	74.64	72.60	71.59	71.17	72.49	71.01	73.26	73.37	72.30	71.97	71.39	70.84	71.01	71.84
BCPMW-7-1	124.81		72.00	71.33	74.99	72.99	71.97	71.51	72.78	71.53	73.62	73.71	72.71	72.31	71.77	71.2	71.33	72.26
MW-200-1	123.49		72.16	71.37	75.07	73.14	72.08	71.72	72.98	71.52	73.69	73.83	72.76	72.59	71.91	71.34	71.53	72.31
MW-201-1	121.69		72.04	71.10	74.84	72.87	71.79	71.33	72.69	71.25	73.48	73.55	72.53	72.28	71.65	71.09	71.28	72.05
MW-202-1	119.27		71.90	71.13	74.83	72.82	71.77	71.32	72.66	71.21	73.46	73.57	73.51	72.23	71.6	70.98	71.23	--
MW-203-1	118.25		71.83	71.10	74.75	72.77	71.75	71.30	72.61	70.20	73.43	73.52	72.49	72.13	71.56	71.02	71.17	72.01
Piezometers																		
PZ-1a	128.82		72.56	71.15	74.87	72.94	71.85	71.33	72.76	71.31	73.54	73.62	72.63	72.42	71.72	71.23	71.39	--
PZ-1b	128.92		72.47	71.09	74.78	72.88	71.82	71.28	72.70	71.24	73.47	73.55	72.56	72.36	71.64	71.16	71.35	72.06
PZ-1c	128.96		72.47	71.48	75.15	73.23	72.13	71.74	73.16	71.56	73.83	73.9	72.90	72.68	71.94	71.46	71.63	72.39
PZ-2a	128.36		72.47	71.09	74.82	72.87	71.81	71.34	72.74	71.30	73.45	73.57	72.57	72.32	71.64	71.14	71.32	72.06
PZ-2b	128.37		72.43	71.08	74.77	72.86	71.78	71.30	72.68	71.27	73.45	73.55	72.54	72.28	71.61	71.13	71.29	72.05
PZ-2c	128.55		72.41	71.40	75.05	73.15	72.05	71.68	73.05	71.52	73.74	73.87	72.82	72.55	71.88	71.38	71.55	72.34
PZ-3	124.99		72.52	70.94	74.69	72.71	71.65	70.93	72.55	71.08	73.28	73.4	72.35	72.16	71.44	71.06	71.18	71.92
PZ-4	125.31		72.50	71.07	74.81	72.83	71.78	71.45	72.64	71.32	73.42	73.52	72.54	72.32	71.63	71.18	71.33	72.05
PZ-5a	129.07		72.50	71.94	75.61	73.79	72.59	72.17	73.70	71.98	74.27	74.39	73.40	73.25	72.45	71.94	72.16	72.84
PZ-5b	129.06		72.50	71.84	75.53	73.69	72.51	72.08	73.67	71.88	74.16	74.29	73.29	73.15	72.35	71.85	72.08	72.73
PZ-6a	125.67		72.50	71.03	74.73	72.84	71.70	71.24	72.56	71.24	73.37	73.46	72.43	72.13	71.5	70.95	71.17	71.91
PZ-6b	125.74		72.50	7														

Table 12. Summary of Calculated Vertical Groundwater Hydraulic Gradients, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Observation Well Pairing			10/5/2012			2/13/2013			5/13/2013			8/13/2013		
Shallow	Deep	Vertical Distance Between Screens (ft)	Observed Head		Vertical Hydraulic Gradient (1) (ft/ft)									
			Shallow (ft msl)	Deep (ft msl)		Shallow (ft msl)	Deep (ft msl)		Shallow (ft msl)	Deep (ft msl)		Shallow (ft msl)	Deep (ft msl)	
PZ-1A	PZ-1B	20	71.72	71.64	-0.004	71.23	71.16	-0.0035	71.39	71.35	-0.002	--	72.06	--
PZ-1B	PZ-1C	50	71.64	71.94	0.006	71.16	71.46	0.006	71.35	71.63	0.0056	72.06	72.39	0.0066
PZ-2A	PZ-2B	20	71.64	71.61	-0.0015	71.14	71.13	-0.0005	71.32	71.29	-0.0015	72.06	72.05	-0.0005
PZ-2B	PZ-2C	50	71.61	71.88	0.0054	71.13	71.38	0.005	71.29	71.55	0.0052	72.05	72.34	0.0058
PZ-5A	PZ-5B	45	72.45	72.35	-0.0022	71.94	71.85	-0.002	72.16	72.08	-0.0018	72.84	72.73	-0.0024
PZ-6A	PZ-6B	25	71.50	71.43	-0.0028	70.95	70.88	-0.0028	71.17	71.11	-0.0024	71.91	71.81	-0.004
PZ-7A	PZ-7B	48	71.78	71.54	-0.005	71.20	71.05	-0.0031	71.35	71.16	-0.004	72.26	71.54	-0.015
BCPMW-4-1	BCPMW-4-2	21	71.89	71.92	0.0014	71.41	71.42	0.0005	71.56	71.58	0.001	72.32	72.31	-0.0005
BCPMW-4-2	BCPMW-4-3	44	71.92	71.97	0.0011	71.42	71.53	0.0025	71.58	71.67	0.002	72.31	72.43	0.0027
BCPMW-6-1	BCPMW-6-2	44.5	71.73	71.39	-0.0072	71.12	70.84	-0.0076	71.32	71.01	-0.0063	72.15	71.84	-0.0070

Notes:

- Positive groundwater hydraulic gradient indicates a vertically upward gradient and a negative groundwater hydraulic gradient indicates vertically downward gradient.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells,
Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/L)	Sample Location: B24MW-2 B24MW-2 B24MW-2 B24MW-2					B24MW-3	B24MW-3	B24MW-3
	Sample Date: 4/23/2009	4/23/2009	10/4/2010	10/27/2011	10/3/2012	4/20/2009	10/6/2010	10/27/2011
NYSDEC SCGs								
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	0.62 J	< 5	< 5
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50 J	< 50	< 50
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 50	< 50 J	< 50	< 50
Acetone	NE	< 50 B	< 50	< 50 B	< 50	< 50	< 50	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	0.41 J	< 5	< 5	< 5
Chloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	7	< 5	0.3 J	< 5	1.3 J	< 5	< 5	0.32 J
Chloromethane	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	5	< 5	< 5	< 5	1.9 J	10	1.2 J	0.4 J
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	5	--	< 5	--	0.45 J	--	< 5	--
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 5	< 5	< 5	< 5	0.51 J	< 5	< 5
Toluene	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethene	5	3.7 J	4.4 J	3.2 J	25	45	5.9	1.4 J
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Total VOCs ⁽⁴⁾		3.7	4.7	3.2	29	56	7.1	2.1
Project VOCs ⁽⁵⁾		3.7	4.4	3.2	27	56	7.1	1.8

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/L)	Sample Location: B24MW-3	B30MW-1 4/23/2009	B30MW-1 10/4/2010	B30MW-1 10/27/2011	B30MW-1 10/3/2012	BCPMW-1 4/28/2009
NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5	0.37 J
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 50	< 50
Acetone	NE	< 50	< 50 B	< 50 B	< 50	< 50 B
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5	< 5
Chloroethane	5	< 5	< 5	< 5	< 5	< 5
Chloroform	7	0.38 J	< 5	< 5	< 5	0.88 J
Chloromethane	5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	5	0.62 J	< 5	< 5	< 5	22
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	5	< 5	--	< 5	--	--
Methylene Chloride	5	< 5	< 5	< 5	< 5	0.52 J
Styrene	5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 5	< 5	< 5	< 5	< 5
Toluene	5	< 5	< 5	< 5	< 5	0.33 J
trans-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	0.44 J
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Trichloroethene	5	1 J	< 5	< 5	< 5	190
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2
Xylene-o	5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 5
Total VOCs ⁽⁴⁾	2.0	0	0	0	0	220
Project VOCs ⁽⁵⁾	1.6	0	0	0	0	210

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells,
Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/L)	Sample Location: BCPMW-2	BCPMW-3 Sample Date: 4/28/2009	BCPMW-4-1 4/17/2009	BCPMW-4-1 12/1/2009	BCPMW-4-1 10/4/2010	BCPMW-4-1 10/28/2011
NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 10	< 25	< 25	2.4 J	14 J
1,1,2,2-Tetrachloroethane	5	< 10	< 25	< 25	< 5	< 25
1,1,2-Trichloroethane	1	< 10	< 25	< 25	0.38 J	< 25
1,1-Dichloroethane	5	8 J	9.6 J	6.5 J	46	38
1,1-Dichloroethene	5	3.8 J	43	1.8 J	14	21 J
1,2-Dichloroethane	0.6	0.68 J	< 25	< 25	0.65 J	< 25
1,2-Dichloropropane	1	< 10	< 25	< 25	4.7 J	3.8 J
2-Butanone	NE	< 100	< 250	< 250	< 50	< 250
2-Hexanone	50	< 100	< 250	< 250 J	< 50	< 250
4-methyl-2-pentanone	50	< 100	< 250	< 250 J	< 50	< 250
Acetone	NE	< 100	< 250	< 250 J	< 50	< 250B
Benzene	1	< 1.4	< 3.5	< 3.5	0.44 J	< 3.5
Bromodichloromethane	50	< 10	< 25	< 25	< 5	< 25
Bromoform	50	< 10	< 25	< 25	< 5	< 25
Bromomethane	5	< 10	< 25	< 25	R	< 25
Carbon Disulfide	60	< 10	< 25	< 25	< 5	< 25
Carbon tetrachloride	5	< 10	< 25	< 25	< 5	< 25
Chlorobenzene	5	< 10	< 25	< 25	< 5	< 25
Chlorodifluoromethane (Freon 22)	NE	< 10	< 25	17 J	6.2	4.3 J
Chloroethane	5	< 10	< 25	< 25	2.4 J	4.1 J
Chloroform	7	< 10	< 25	< 25	< 5	< 25
Chloromethane	5	< 10	< 25	< 25	R	< 25
cis-1,2-dichloroethene	5	310	900	1800 D	750 D	510
cis-1,3-dichloropropene	0.4	< 10	< 25	< 25	< 5	< 25
Dibromochloromethane	50	< 10	< 25	< 25	< 5	< 25
Dichlorodifluoromethane (Freon 12)	5	< 10	< 25	< 25	< 5	< 25
Ethylbenzene	5	< 10	< 25 B	< 25	< 5	< 25
Methyl tert-Butyl Ether	5	--	--	--	--	< 25
Methylene Chloride	5	< 10	< 25	< 25	< 5	< 25
Styrene	5	< 10	< 25	< 25	< 5	< 25
Tetrachloroethene	5	1.5 J	< 25	< 25	0.64 J	< 25
Toluene	5	< 10	< 25 B	< 25	< 5	< 25
trans-1,2-dichloroethene	5	2.4 J	8.9 J	110	2.5 J	3.9 J
trans-1,3-dichloropropene	0.4	< 10	< 25	< 25	< 5	< 25
Trichloroethene	5	180	470	22 J	170	45
Trichlorotrifluoroethane (Freon 113)	5	< 10	< 25	< 25	< 5	< 25
Vinyl Chloride	2	4.1	300	180	540 D	220
Xylene-o	5	< 10	< 25 B	< 25	8	< 25
Xylenes - m,p	5	< 10	< 25 B	< 25	< 5	< 25
Total VOCs ⁽⁴⁾		510	1,700	2,100	1,500	860
Project VOCs ⁽⁵⁾		510	1,700	2,100	1,500	850

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells,
Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.^(1,2,3)

COMPOUND (ug/L)	Sample Location: <i>BCPMW-4-1</i> Sample Date: <i>10/3/2012</i>	<i>BCPMW-4-2</i> 4/17/2009	<i>BCPMW-4-2</i> 12/4/2009	<i>BCPMW-4-2</i> 10/7/2010	<i>BCPMW-4-2</i> 10/28/2011	<i>BCPMW-4-2</i> 10/3/2012
NYSDEC <u>SCGs</u>						
1,1,1-Trichloroethane	5 29	< 250	< 10	< 5	0.33 J	0.23 J
1,1,2,2-Tetrachloroethane	5 < 25	< 250	< 10	< 5	< 5	< 5
1,1,2-Trichloroethane	1 1.7 J	< 250	< 10	< 5	< 5	< 5
1,1-Dichloroethane	5 39	57 J	8.7 J	7.3	2.6 J	1.4 J
1,1-Dichloroethene	5 24 J	34 J	2.7 J	1.9 J	1.1 J	0.8 J
1,2-Dichloroethane	0.6 4.8 J	< 250	< 10	0.91 J	0.85 J	0.45 J
1,2-Dichloropropane	1 5.1 J	< 250	< 10	0.9 J	0.39 J	< 5
2-Butanone	NE < 250	< 2500	< 100	< 50	< 50	< 50
2-Hexanone	50 < 250	< 2500 J	< 100	< 50	< 50	< 50
4-methyl-2-pentanone	50 < 250	< 2500 J	< 100	< 50	< 50	< 50
Acetone	NE < 250	< 2500 J	< 100	< 50 B	< 50	< 50
Benzene	1 < 3.5	< 35	< 1.4	< 0.7	< 0.7 U	< 0.7
Bromodichloromethane	50 < 25	< 250	< 10	< 5	< 5	< 5
Bromoform	50 < 25	< 250	< 10	< 5	< 5	< 5
Bromomethane	5 < 25	< 250	< 10	< 5	< 5	< 5
Carbon Disulfide	60 < 25	< 250	< 10	< 5	< 5	< 5
Carbon tetrachloride	5 < 25	< 250	< 10	< 5	< 5	< 5
Chlorobenzene	5 < 25	< 250	< 10	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE < 25	< 250	0.8 J	< 5	< 5	< 5
Chloroethane	5 1.6 J	< 250	1.1 J	0.79 J	< 5	< 5
Chloroform	7 < 25	< 250	< 10	0.96 J	0.62 J	0.54 J
Chloromethane	5 < 25	< 250	R	< 5	< 5	< 5
cis-1,2-dichloroethene	5 840	18000 D	270	99	59	70
cis-1,3-dichloropropene	0.4 < 25	< 250	< 10	< 5	< 5	< 5
Dibromochloromethane	50 < 25	< 250	< 10	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5 < 25	< 250	< 10	< 5	< 5	< 5
Ethylbenzene	5 < 25	62 J	0.78 J	< 5	< 5	< 5
Methyl tert-Butyl Ether	5 < 25	--	--	0.35 J	0.28 J	0.29 J
Methylene Chloride	5 < 25	< 250	< 10	< 5	< 5	< 5
Styrene	5 < 25	< 250	< 10	< 5	< 5	< 5
Tetrachloroethene	5 < 25	< 250	0.82 J	0.73 J	0.59 J	0.91 J
Toluene	5 < 25	2400	< 10 B	< 5	< 5	< 5
trans-1,2-dichloroethene	5 2.2 J	< 250	1.3 J	0.65 J	0.41 J	0.5 J
trans-1,3-dichloropropene	0.4 < 25	< 250	< 10	< 5	< 5	< 5
Trichloroethene	5 110	< 250	310	66	50	68
Trichlorotrifluoroethane (Freon 113)	5 < 25	< 250	< 10	< 5	< 5	< 5
Vinyl Chloride	2 420	6300	58	54	20	9.5
Xylene-o	5 < 25	110 J	< 10 B	< 5	< 5	< 5
Xylenes - m,p	5 < 25	190 J	< 10 B	< 5	< 5	< 5
Total VOCs⁽⁴⁾		1,500	27,000	660	230	140
Project VOCs⁽⁵⁾		1,500	27,000	650	230	130

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells,
Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.^(1,2,3)

COMPOUND (ug/L)	Sample Location:	BCPMW-4-3	BCPMW-4-3	BCPMW-4-3	BCPMW-4-3	BCPMW-4-3	BCPMW-5-1
	Sample Date:	4/17/2009	12/1/2009	10/7/2010	10/28/2011	10/3/2012	4/23/2009
NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 5	< 100
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5	< 100
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5	< 100
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5	< 5	< 100
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5	21 J
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5	< 100
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5	< 100
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50	< 1000
2-Hexanone	50	< 50 J	< 50	< 50	< 50	< 50	< 1000
4-methyl-2-pentanone	50	< 50 J	< 50	< 50	< 50	< 50	< 1000
Acetone	NE	< 50 J	< 50	< 50	< 50	< 50	< 1000
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 14
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5	< 100
Bromoform	50	< 5	< 5	< 5	< 5	< 5	< 100
Bromomethane	5	< 5	< 5	< 5	< 5	< 5	< 100
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5	< 100
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 5	< 100
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5	< 100
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5	< 5	< 100
Chloroethane	5	< 5	< 5	< 5	< 5	< 5	< 100
Chloroform	7	0.53 J	0.32 J	< 5	< 5	0.2 J	< 100
Chloromethane	5	< 5	R	< 5	< 5	< 5	< 100
cis-1,2-dichloroethene	5	0.37 J	< 5	< 5	< 5	< 5	960
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 100
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 5	< 100
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5	< 100
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5	48 J
Methyl tert-Butyl Ether	5	--	--	< 5	< 5	< 5	--
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5	< 100
Styrene	5	< 5	< 5	< 5	< 5	< 5	< 100
Tetrachloroethene	5	< 5	< 5	< 5	0.27 J	0.3 J	< 100
Toluene	5	< 5	< 5	< 5	< 5	< 5	2700
trans-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	< 5	< 100
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 100
Trichloroethene	5	0.56 J	0.51 J	0.41 J	0.74 J	0.84 J	220
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	0.38 J	< 5	< 100
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2	330
Xylene-o	5	< 5	< 5	< 5	< 5	< 5	40 J
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 5	110
Total VOCs⁽⁴⁾		1.5	0.83	0.41	1.4	1.3	4,400
Project VOCs⁽⁵⁾		0.93	0.51	0.41	1.0	1.1	4,400

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells,
Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.^(1,2,3)

COMPOUND (ug/L)	Sample Location:	BCPMW-6-1	BCPMW-6-1	BCPMW-6-1	BCPMW-6-1	BCPMW-6-1
	Sample Date:	4/20/2009	12/4/2009	10/6/2010	10/31/2011	10/3/2012
NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 5	< 5	< 100	< 250	< 100
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 100	< 250	< 100
1,1,2-Trichloroethane	1	< 5	< 5	< 100	< 250	< 100
1,1-Dichloroethane	5	0.3 J	< 5	< 100	< 250	< 100
1,1-Dichloroethene	5	< 5	< 5	< 100	< 250	< 100
1,2-Dichloroethane	0.6	< 5	< 5	< 100	< 250	< 100
1,2-Dichloropropane	1	< 5	< 5	< 100	< 250	< 100
2-Butanone	NE	< 50	< 50	< 1000	< 2500	< 1000
2-Hexanone	50	< 50 J	< 50	< 1000	< 2500	< 1000
4-methyl-2-pentanone	50	< 50 J	< 50	< 1000	< 2500	< 1000
Acetone	NE	< 50 J	< 50	< 1000	< 2500	< 1000
Benzene	1	< 0.7	< 0.7	< 14	< 35	< 14
Bromodichloromethane	50	< 5	< 5	< 100	< 250	< 100
Bromoform	50	< 5	< 5	< 100	< 250	< 100
Bromomethane	5	< 5	R	< 100	< 250	< 100
Carbon Disulfide	60	< 5	< 5	< 100	< 250	< 100
Carbon tetrachloride	5	< 5	< 5	< 100	< 250	< 100
Chlorobenzene	5	< 5	< 5	< 100	< 250	< 100
Chlorodifluoromethane (Freon 22)	NE	4500 D	1700 EJ	10000 D	7100	2100
Chloroethane	5	< 5	< 5	< 100	< 250	< 100
Chloroform	7	1.7 J	0.32 J	< 100	< 250	< 100
Chloromethane	5	< 5	R	< 100	< 250	< 100
cis-1,2-dichloroethene	5	21	1.7 J	< 100	< 250	< 100
cis-1,3-dichloropropene	0.4	< 5	< 5	< 100	< 250	< 100
Dibromochloromethane	50	< 5	< 5	< 100	< 250	< 100
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 100	< 250	< 100
Ethylbenzene	5	< 5	< 5	< 100	< 250	< 100
Methyl tert-Butyl Ether	5	--	--	< 100	< 250	< 100
Methylene Chloride	5	< 5	< 5	< 100	< 250	< 100
Styrene	5	< 5	< 5	< 100	< 250	< 100
Tetrachloroethene	5	0.34 J	< 5	< 100	< 250	< 100
Toluene	5	< 5	< 5	< 100	< 250	< 100
trans-1,2-dichloroethene	5	< 5	< 5	< 100	< 250	< 100
trans-1,3-dichloropropene	0.4	< 5	< 5	< 100	< 250	< 100
Trichloroethene	5	4.9 J	1.6 J	< 100	< 250	< 100
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 100	< 250	< 100
Vinyl Chloride	2	< 2	< 2	< 40	< 100	< 40
Xylene-o	5	< 5	< 5	< 100	< 250	< 100
Xylenes - m,p	5	< 5	< 5	< 100	< 250	< 100
Total VOCs⁽⁴⁾		4,500	1,700	10,000	7,100	2,100
Project VOCs⁽⁵⁾		27	2.3	0	0	0

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells,
Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/L)	Sample Location:	BCPMW-6-2	BCPMW-6-2	BCPMW-6-2	BCPMW-6-2	BCPMW-6-2
	Sample Date:	5/8/2009	12/4/2009	10/6/2010	10/31/2011	10/3/2012
NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 5	0.78 J	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	0.37 J	0.65 J	0.47 J	0.41 J	0.23 J
1,1-Dichloroethene	5	< 5	0.44 J	< 5	0.3 J	< 5
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 50	< 50
Acetone	NE	< 50	< 50	< 50	< 50	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	R	< 5	< 5	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5	0.64 J
Chloroethane	5	< 5	< 5	< 5	< 5	< 5
Chloroform	7	0.53 J	< 5	0.41 J	0.3 J	0.38 J
Chloromethane	5	< 5	R	< 5	< 5	< 5
cis-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	< 5
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	5	--	--	<5	0.33 J	0.24 J
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5
Styrene	5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 5	0.79 J	2.1 J	1.8 J	1.6 J
Toluene	5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Trichloroethene	5	< 5	0.45 J	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2
Xylene-o	5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 5
Total VOCs ⁽⁴⁾		0.90	3.1	3.0	3.1	3.1
Project VOCs ⁽⁵⁾		0.37	3.1	2.6	2.5	1.8

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells,
Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/L)	Sample Location: BCPMW-7-1	BCPMW-7-1 4/20/2009	BCPMW-7-1 12/1/2009	BCPMW-7-1 10/7/2010	BCPMW-7-1 11/1/2011	BCPMW-7-1 10/4/2012	MW-200-1 4/29/2009
NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5	< 5	0.79 J
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50 J	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	50	< 50 J	< 50	< 50	< 50	< 50	< 50
Acetone	NE	< 50	< 50	< 50	< 50	< 50	< 50 B
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	R	< 5	< 5	< 5	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5	< 5
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	2.6 J	1.5 J	5.2	9.2	3.6 J	< 5
Chloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	7	< 5	< 5	< 5	< 5	0.37 J	2.3 J
Chloromethane	5	< 5	R	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	< 5	38
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	5	--	--	< 5	0.22 J	0.26 J	--
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 5	< 5	< 5	< 5	< 5	0.54 J
Toluene	5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	< 5	0.3 J
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethene	5	< 5	< 5	< 5	< 5	< 5	34
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 5	< 5
Total VOCs ⁽⁴⁾		2.6	1.5	5.2	9.4	4.2	76
Project VOCs ⁽⁵⁾		0.0	0.0	0.0	0.22	0.0	74

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells,
Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/L)	Sample Location: MW-200-1	MW-200-1	MW-200-1	MW-200-1	MW-201-1 5/1/2009	MW-201-1 12/2/2009	MW-201-1 10/5/2010
	Sample Date: 12/2/2009	10/5/2010	11/3/2011	10/4/2012			
NYSDEC SCGs							
1,1,1-Trichloroethane	5	< 5	< 5	< 5	5.5 J	3.3 J	< 50
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 25	< 50	< 50
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 25	< 50	< 50
1,1-Dichloroethane	5	< 5	< 5	< 5	10 J	9 J	14 J
1,1-Dichloroethene	5	< 5	< 5	< 5	7.9 J	8.1 J	6.9 J
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 25	< 50	< 50
1,2-Dichloropropane	1	< 5	< 5	< 5	< 25	< 50	< 50
2-Butanone	NE	< 50	< 50	< 50	< 250	< 500	< 500
2-Hexanone	50	< 50	< 50	< 50	< 250	< 500	< 500
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 250	< 500	< 500
Acetone	NE	< 50	< 50	< 50	< 250 B	< 500	< 500
Benzene	1	< 0.7	< 0.7	< 0.7	< 3.5	< 7	< 7
Bromodichloromethane	50	< 5	< 5	< 5	< 25	< 50	< 50
Bromoform	50	< 5	< 5	< 5	< 25	< 50	< 50
Bromomethane	5	R	< 5	< 5	< 25	< 50	< 50
Carbon Disulfide	60	< 5	< 5	< 5	< 25	< 50	< 50
Carbon tetrachloride	5	< 5	< 5	< 5	< 25	< 50	< 50
Chlorobenzene	5	< 5	< 5	< 5	< 25	< 50	< 50
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 25	< 50	< 50
Chloroethane	5	< 5	< 5	< 5	< 25	< 50	< 50
Chloroform	7	2.3 J	0.5 J	0.21 J	< 5	< 25	< 50
Chloromethane	5	R	< 5	< 5	< 25	R	< 50
cis-1,2-dichloroethene	5	5.7	3.5 J	11	1.5 J	970 D	1300
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 25	< 50	< 50
Dibromochloromethane	50	< 5	< 5	< 5	< 25	< 50	< 50
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 25	< 50	< 50
Ethylbenzene	5	< 5	< 5	< 5	< 25	< 50	< 50
Methyl tert-Butyl Ether	5	--	< 5	< 5	--	--	< 50
Methylene Chloride	5	< 5	< 5	< 5	< 25	< 50	< 50
Styrene	5	< 5	< 5	< 5	< 25	< 50	< 50
Tetrachloroethene	5	< 5	< 5	0.43 J	< 5	< 25	< 50
Toluene	5	< 5	< 5	< 5	< 25	< 50	< 50
trans-1,2-dichloroethene	5	< 5	< 5	< 5	2.7 J	3.5 J	6.7 J
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 25	< 50	< 50
Trichloroethene	5	12	7	20	3.8 J	160	230
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 25	< 50	< 50 U
Vinyl Chloride	2	< 2	< 2	< 2	< 10	38	820
Xylene-o	5	< 5	< 5	< 5	< 25	< 50	7.2 J
Xylenes - m,p	5	< 5	< 5	< 5	< 25	< 50	< 50
Total VOCs ⁽⁴⁾	20	11	32	5.3	1,200	1,600	4,800
Project VOCs ⁽⁵⁾	18	11	31	5.3	1,200	1,600	4,800

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells,
Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/L)	Sample Location: MW-201-1 Sample Date: 11/3/2011	MW-201-1 10/4/2012	MW-202-1 5/1/2009	MW-202-1 12/2/2009	MW-202-1 10/6/2010	MW-202-1 11/3/2011
NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	0.32 J
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	0.51 J	1.2 J	< 5	< 5	0.86 J
1,1-Dichloroethene	5	0.21 J	0.65 J	< 5	< 5	0.72 J
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 50	< 50
Acetone	NE	< 50	< 50	< 50	< 50	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	0.61 J	0.21 J
Chloroethane	5	< 5	< 5	< 5	< 5	< 5
Chloroform	7	3.2 J	2.9 J	6.2	6.7	0.93 J
Chloromethane	5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	5	61	180 D	0.64 J	0.58 J	< 5
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	5	0.75 J	0.22 J	--	--	0.37 J
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5
Styrene	5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	0.24 J	0.24 J	< 5	< 5	0.48 J
Toluene	5	< 5 J	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	5	< 5	0.59 J	< 5	< 5	< 5
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Trichloroethene	5	20	20	7.5	9.3	2.4 J
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	0.43 J
Vinyl Chloride	2	< 2 U	13	< 2	< 2	< 2
Xylene-o	5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 5
Total VOCs ⁽⁴⁾		86	220	14	17	4.9
Project VOCs ⁽⁵⁾		82	220	8.1	9.9	3.6

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells,
Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/L)	Sample Location: MW-202-1	MW-203-1 5/1/2009	MW-203-1 12/2/2009	MW-203-1 10/5/2010	MW-203-1 11/1/2011	MW-203-1 10/3/2012
	Sample Date: 10/4/2012					
NYSDEC SCGs						
1,1,1-Trichloroethane	5	0.74 J	< 5	< 5	< 5	0.26 J
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	2.1 J	< 5	< 5	< 5	0.32 J
1,1-Dichloroethene	5	1.9 J	< 5	< 5	< 5	0.44 J
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 50	< 50
Acetone	NE	< 50	< 50 B	< 50	< 50 B	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	73	17	29	8.9
Chloroethane	5	< 5	< 5	< 5	< 5	< 5
Chloroform	7	< 5	7.9	2.6 J	1.5 J	0.68 J
Chloromethane	5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	5	0.4 J	1.6 J	0.83 J	0.97 J	1.4 J
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	5	< 5	--	--	0.88 J	0.41 J
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5
Styrene	5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	1.7 J	< 5	< 5	< 5	0.35 J
Toluene	5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Trichloroethene	5	1.2 J	1.3 J	0.7 J	1.6 J	2.9 J
Trichlorotrifluoroethane (Freon 113)	5	0.76 J	< 5	< 5	< 5	1.1 J
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2
Xylene-o	5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 5
Total VOCs ⁽⁴⁾		8.8	84	21	34	15
Project VOCs ⁽⁵⁾		8.0	2.9	1.5	2.6	5

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

Notes:

- (1) Results validated following protocols specified in Sampling and Analysis Plan in the December 2009 DRAFT OM&M Manual (ARCADIS 2009).
(2) Samples analyzed for the TCL VOCs using NYSDEC ASP 2000 Method OLM4.2.
(3) Sampling method changed from 3 well volume purge to HydraSleeve™ no purge method, see Section 6 of this report.
(4) "Total VOCs" represents the sum of individual concentrations of the VOCs detected.
(5) "Project VOCs" represents the sum of individual compound concentrations of 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,2-Dichloroethane; 1,1-Dichloroethene; Tetrachloroethene; Trichloroethene; Vinyl Chloride; cis-1,2-Dichloroethene; trans-1,2-Dichloroethene; Benzene; Toluene; and Xylenes-o,m, and p.

Acronyms\Key:

 Indicates an exceedance of an SCG.

Bold value indicates a detection.

Concentration values are rounded to two significant figures.

Italicized samples collected with HydraSleeve™ no purge method.

RI/FS Remedial Investigation/Feasibility Study.

NYSDEC New York State Department of Environmental Conservation.

TCL Target compound list.

VOC Volatile Organic Compound.

ASP Analytical services protocol.

SCGs Standards, criteria, and guidance values.

ug/L Micrograms per liter.

NE Not established.

E Concentration for the constituent exceeded the calibration range.

J Value is estimated.

D Constituent identified from secondary dilution.

R Concentration for the constituent was rejected.

B Compound detected in associated blank sample.

< 5 Compound not detected above its laboratory quantification limit.

Table 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2)

COMPOUND (ug/L)	Sample Location: B24MW-2	B24MW-3	BCPMW-1	BCPMW-2	BCPMW-3	BCPMW-4-1 4/17/2009	BCPMW-4-1 10/4/2010	BCPMW-4-1 10/28/2011	BCPMW-4-1 10/3/2012	BCPMW-4-1 10/4/2012
<u>NYSDEC SCGs</u>										
Cadmium (total)	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	--
Cadmium (dissolved)	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	--	< 5
Chromium (total)	50	40.3	28.2	20.8	< 10	< 10	22.7	43	25	32
Chromium (dissolved)	50	< 10	10.6	< 10	< 10	< 10	12.8	41	22	--
Iron (total)	300	--	597	--	< 100	2,080	103	--	--	--
Iron (dissolved)	300	--	< 100	--	< 100	1,760	< 100	--	--	--
Manganese (total)	300	--	16.9	--	12.7	51.4	11.2	--	--	--
Manganese (dissolved)	300	--	13.7	--	11.3	49.2	< 10	--	--	--

See notes on last page.

Table 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2)

COMPOUND (ug/L)	Sample Location:		BCPMW-4-2	BCPMW-4-2	BCPMW-4-2	BCPMW-4-2	BCPMW-4-2	BCPMW-4-3	BCPMW-4-3	BCPMW-4-3	BCPMW-4-3
	Sample Date:		4/17/2009	10/7/2010	10/28/2011	10/3/2012	10/4/2012	4/17/2009	10/7/2010	10/28/2011	10/3/2012
<u>NYSDEC SCGs</u>											
Cadmium (total)	5	< 5	< 5	< 5	< 5	--	< 5	< 5	< 5	< 5	--
Cadmium (dissolved)	5	< 5	--	< 5	--	< 5	< 5	< 5	< 5	--	< 5
Chromium (total)	50	10.6	< 10	< 10	< 10	--	< 10	< 10	< 10	< 10	--
Chromium (dissolved)	50	< 10	--	< 10	--	< 10	< 10	< 10	< 10	--	< 10
Iron (total)	300	4,630	--	--	--	--	< 100	--	--	--	--
Iron (dissolved)	300	4,080	--	--	--	--	< 100	--	--	--	--
Manganese (total)	300	228	--	--	--	--	< 10	--	--	--	--
Manganese (dissolved)	300	217	--	--	--	--	< 10	--	--	--	--

See notes on last page.

Table 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2)

COMPOUND (ug/L)	Sample Location:	BCPMW-5-1	BCPMW-6-1	BCPMW-6-1	BCPMW-6-1	BCPMW-6-1	BCPMW-6-2	BCPMW-6-2	BCPMW-6-2	BCPMW-6-2	BCPMW-6-2	
	Sample Date:	4/23/2009	4/20/2009	10/6/2010	10/31/2011	10/3/2012	10/4/2012	5/8/2009	10/6/2010	10/31/2011	10/3/2012	10/4/2012
NYSDEC <u>SCGs</u>												
Cadmium (total)	5	< 5	< 5	<5	< 5	< 5	--	< 5	<5	<5	< 5	--
Cadmium (dissolved)	5	< 5	< 5	<5	< 5	--	< 5	< 5	<5	<5	< 5	< 5
Chromium (total)	50	< 10	< 10	< 10	14	< 10	--	10.3	<10	<10	< 10	--
Chromium (dissolved)	50	< 10	< 10	<10	< 10	--	< 10	< 10	<10	<10	< 10	< 10
Iron (total)	300	7,420	< 100	--	--	--	--	--	--	--	--	--
Iron (dissolved)	300	6,370	< 100	--	--	--	--	--	--	--	--	--
Manganese (total)	300	145	< 10	--	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	131	< 10	--	--	--	--	--	--	--	--	--

See notes on last page.

Table 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2)

COMPOUND (ug/L)	Sample Location: BCPMW-7-1 BCPMW-7-1 BCPMW-7-1 BCPMW-7-1				MW-200-1	MW-200-1	MW-200-1	MW-200-1 ⁽³⁾	MW-200-1	MW-201-1	MW-201-1
	Sample Date: 4/20/2009	10/7/2010	11/1/2011	10/4/2012	4/29/2009	10/5/2010	11/3/2011	10/4/2012	4/15/2013	5/1/2009	10/5/2010
NYSDEC <u>SCGs</u>											
Cadmium (total)	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	--	< 5	< 5
Cadmium (dissolved)	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	--	< 5	< 5
Chromium (total)	50	< 10	< 10	< 10	< 10	< 10	14	48	1,130	86	< 10
Chromium (dissolved)	50	< 10	< 10	< 10	< 10	< 10	< 10	13	320	21	< 10
Iron (total)	300	< 100	--	--	--	--	--	--	--	--	--
Iron (dissolved)	300	< 100	--	--	--	--	--	--	--	--	--
Manganese (total)	300	106	--	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	94.8	--	--	--	--	--	--	--	--	--

See notes on last page.

Table 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2)

COMPOUND (ug/L)	Sample Location:	MW-201-1	MW-201-1 ⁽³⁾	MW-201-1	MW-202-1	MW-202-1	MW-202-1	MW-202-1 ⁽³⁾	MW-202-1	MW-203-1	MW-203-1	MW-203-1
	Sample Date:	11/3/2011	10/4/2012	4/16/2013	5/1/2009	10/6/2010	11/3/2011	10/4/2012	4/16/2013	5/1/2009	10/5/2010	11/1/2011
NYSDEC <u>SCGs</u>												
Cadmium (total)	5	< 5	< 5	--	< 5	< 5	< 5	< 5	--	< 5	< 5	< 5
Cadmium (dissolved)	5	< 5	< 5	--	< 5	< 5	< 5	< 5	--	< 5	< 5	< 5
Chromium (total)	50	< 10	159	28	16.5	15	23	263 J	19	31.5	31	37
Chromium (dissolved)	50	< 10	42	17	< 10	< 10	< 10	22	< 10	< 10	< 10	< 10
Iron (total)	300	--	--	--	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--	--	--	--

See notes on last page.

Table 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2)

COMPOUND (ug/L)	Sample Location: MW-203-1 ⁽³⁾ MW-203-1 MW-203-1		
	Sample Date:	10/3/2012	10/4/2012
NYSDEC <u>SCGs</u>			
Cadmium (total)	5	< 5	--
Cadmium (dissolved)	5	--	< 5
Chromium (total)	50	1,600	--
Chromium (dissolved)	50	--	84
Iron (total)	300	--	--
Iron (dissolved)	300	--	--
Manganese (total)	300	--	--
Manganese (dissolved)	300	--	--

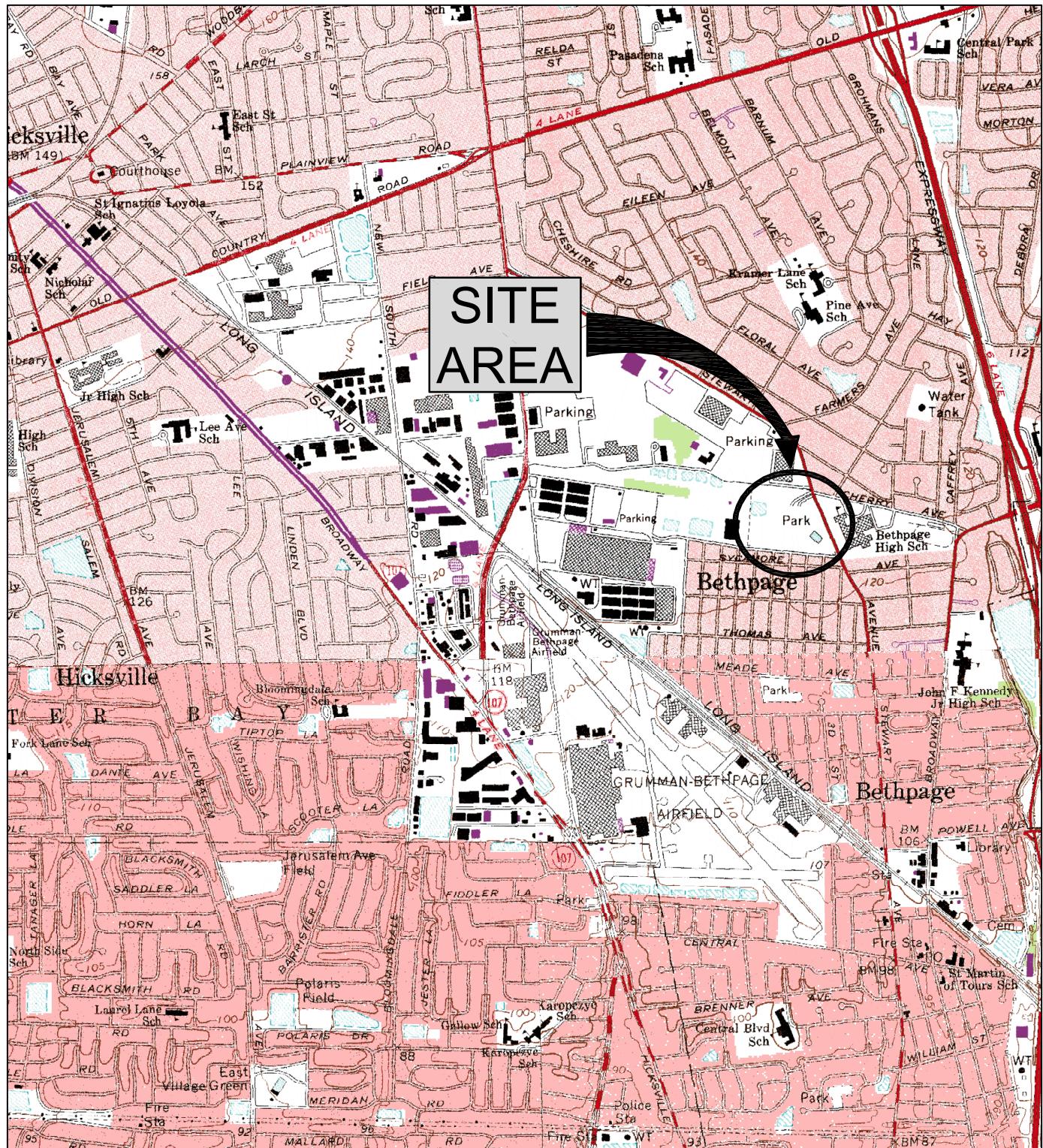
Notes:

- (1) Results validated following protocols specified in Sampling and Analysis Plan in the December 2009 DRAFT OM&M Manual (ARCADIS 2009).
- (2) Samples analyzed for the metals using NYSDEC ASP Method 2000 ILM4.0.
- (3) Samples collected with HydraSleeve™ no purge method, all other samples collected by purge (3-Volume) method.

Acronyms/Key:

	Indicates an exceedance of an SCG.
Bold	indicates a detection.
RI/FS	Remedial Investigation/Feasibility Study.
NYSDEC	New York State Department of Environmental Conservation.
ASP	Analytical services protocol.
SCGs	Standards, criteria, and guidance values.
ug/L	Micrograms per liter.
--	Not analyzed.
< 5	Compound not detected above its laboratory quantification limit.

Figures



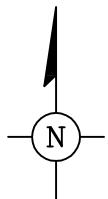
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USGS 7.5 MIN. FREEPORT QUADRANGLE, FREEPORT, NY, 1994

USGS 7.5 MIN. HICKSVILLE QUADRANGLE, HICKSVILLE, NY, 1967, PHOTOREVISED 1979

USGS 7.5 MIN. HUNTINGTON QUADRANGLE, HUNTINGTON, NY, 1967, PHOTOREVISED 1979

PROJECTNAME: ---



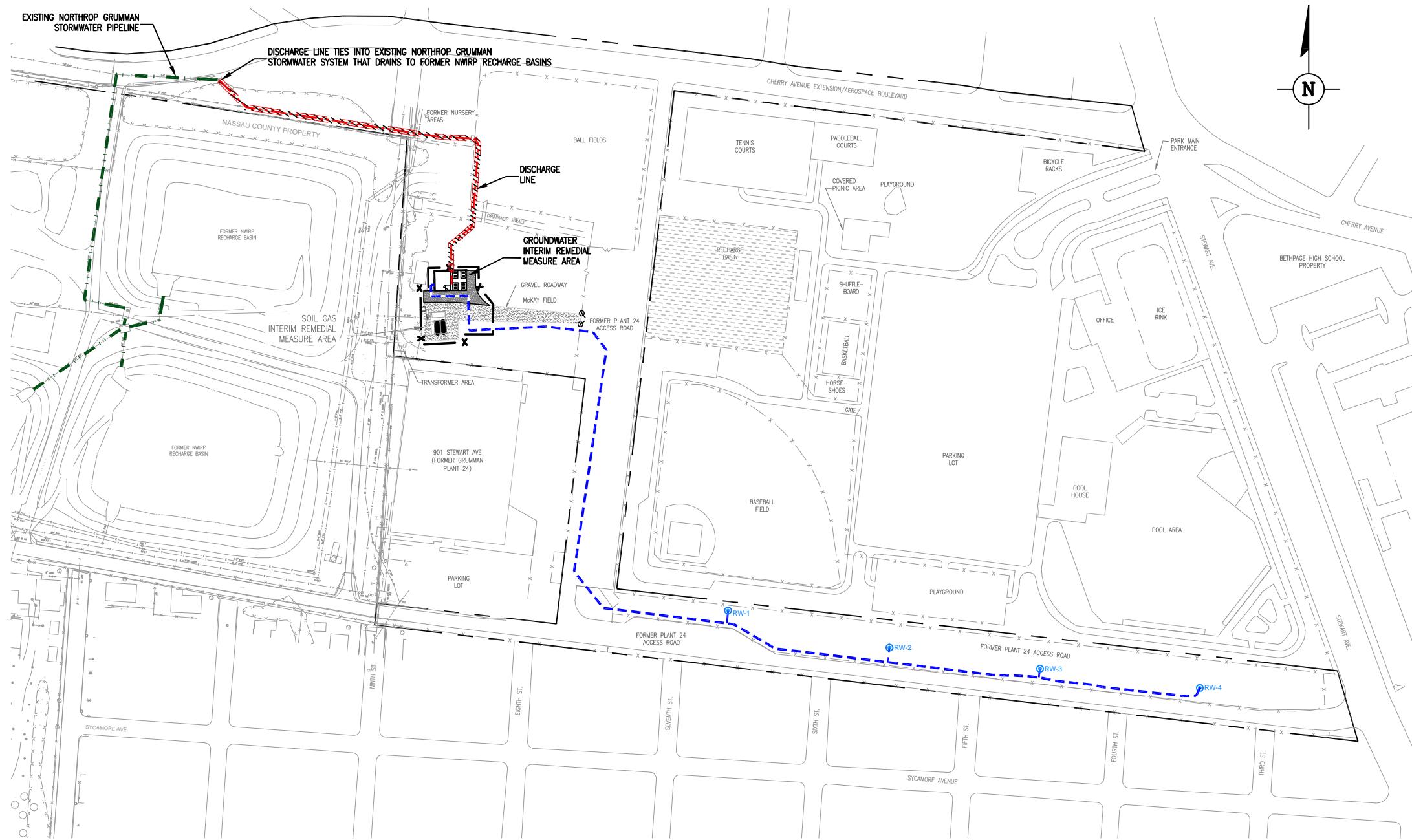
0 2000' 4000'
SCALE IN FEET

GROUNDWATER INTERIM REMEDIAL MEASURE
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

SITE AREA LOCATION

 **ARCADIS**

FIGURE
1



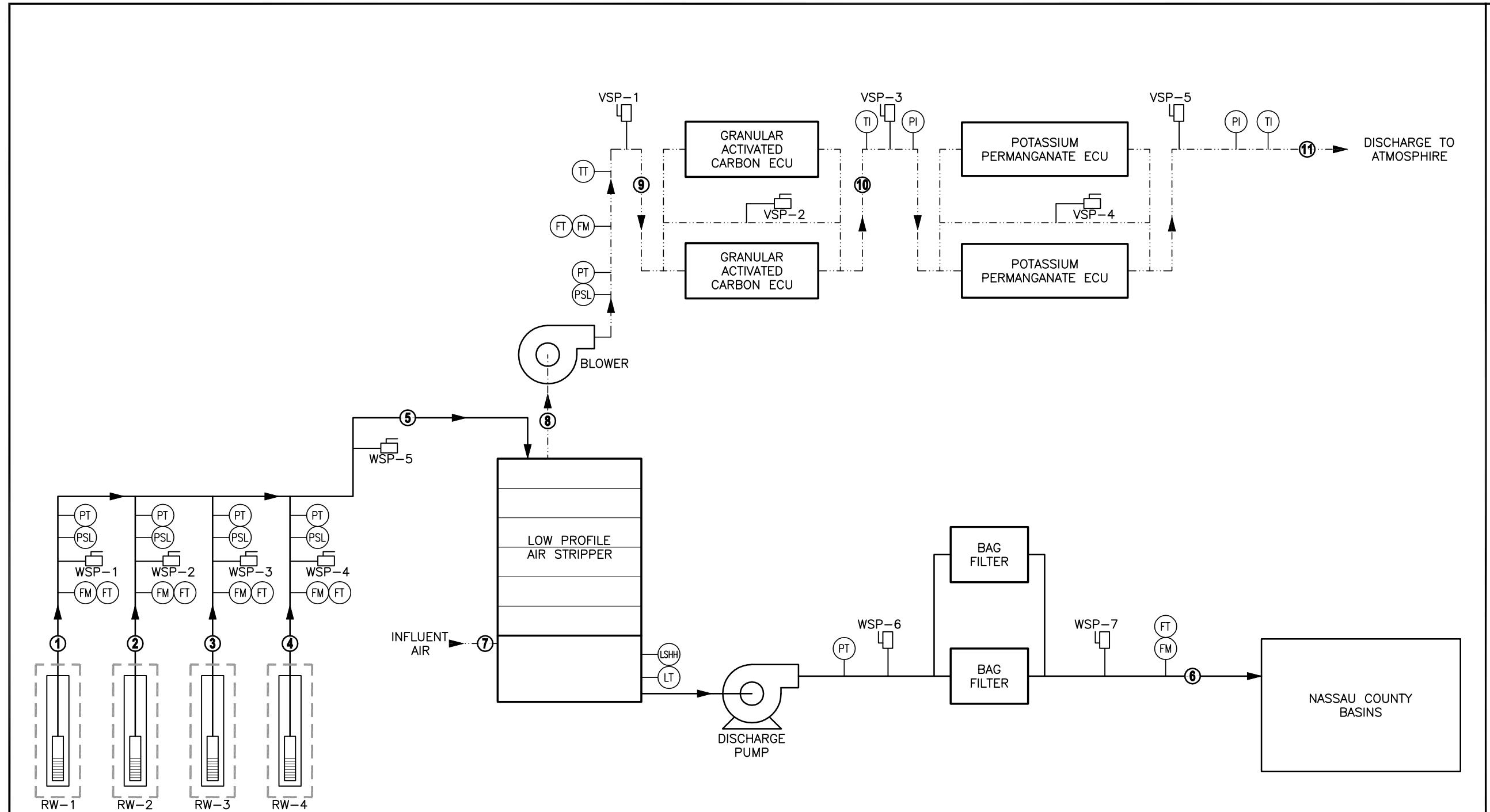
LEGEND:

- NORTHROP GRUMMAN PROPERTY LINE:** Dashed line
- FENCE:** Line with "X" markers
- BITUMINOUS PAVEMENT:** Line with "bit." markers
- GROUNDWATER IRM INFLOW PIPELINE AND ELECTRICAL CONDUITS:** Blue dashed line
- GROUNDWATER IRM EFFLUENT PIPELINE:** Red dashed line with diagonal hatching
- EXISTING NORTHROP GRUMMAN STORMWATER PIPELINE:** Green dashed line with circular arrow icon
- GROUNDWATER INTERIM REMEDIAL MEASURE WELL:** Blue dashed line with circle and "RW" icon
- NWIRP:** Blue dashed line with circle and "NWIRP" icon

GROUNDWATER INTERIM REMEDIAL MEASURE
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

SITE AND GROUNDWATER INTERIM REMEDIAL MEASURE LAYOUT

0 200' 400'
SCALE IN FEET



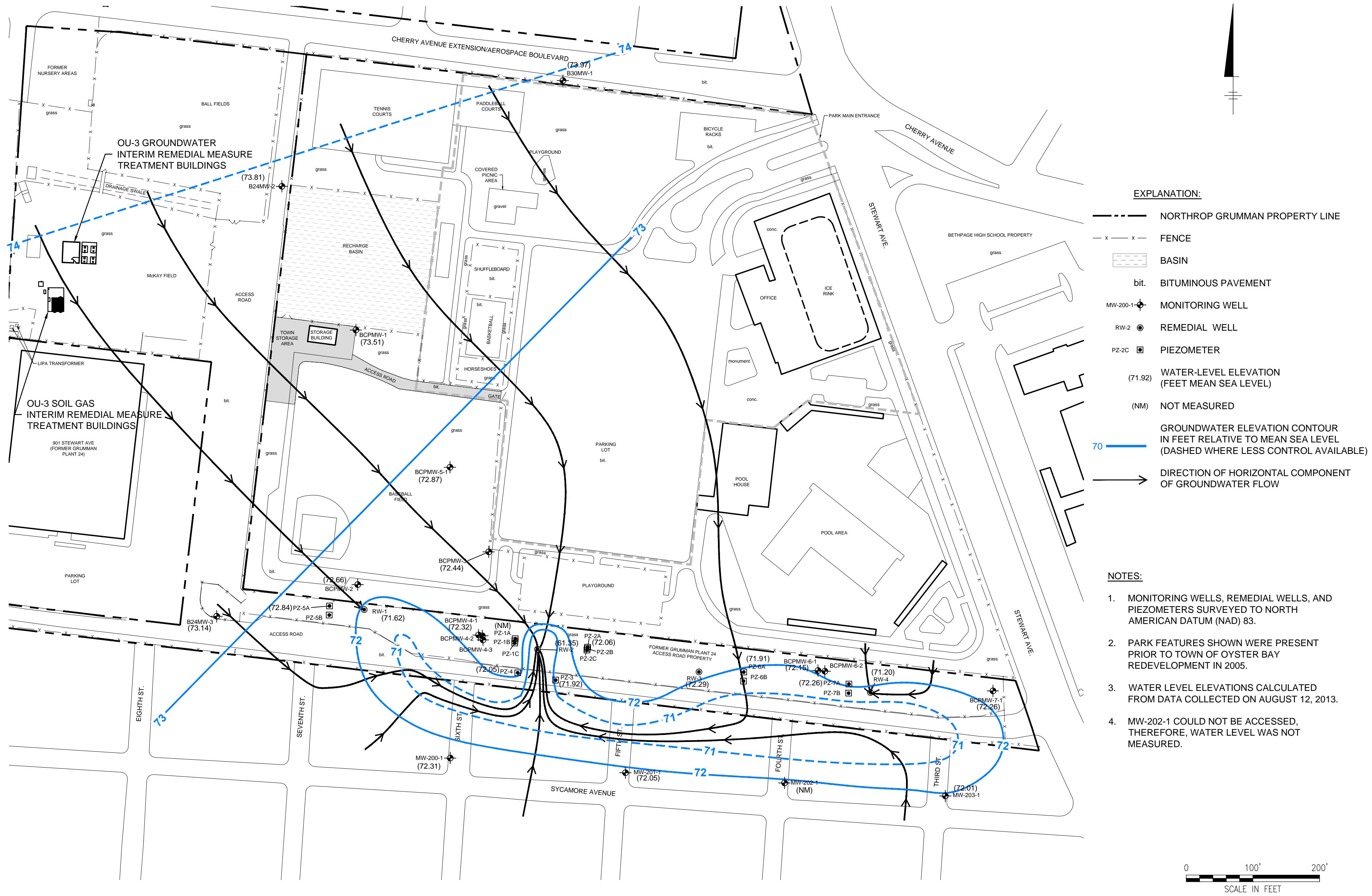
PROCESS	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
Mass Loading (lbs/day)											
Trichloroethene	0.009	0.041	0.082	0.008	0.140	<0.008	0.000	0.140	0.140	<0.014	<0.014
cis -1,2 Dichloroethene	0.007	1.877	0.431	0.030	2.346	<0.008	0.000	2.346	2.346	<0.235	<0.235
Vinyl Chloride	0.000	0.443	0.001	0.000	0.444	<0.003	0.000	0.444	0.444	0.444	<0.044
Flow Rate (gpm)											
40	85	85	40	250	250	---	---	---	---	---	---
Flow Rate (CFM)											
---	---	---	---	---	---	1,300 - 1,600	1,300	1,535	1,557	1,581	
Pressure (feet of water)											
10	10	10	10	8	15	---	---	---	---	---	---
Pressure (inches of water)											
---	---	---	---	---	---	0	- 28 to - 38	12	6	0	
pH											
6.4	6.4	6.4	6.4	6.4	6.4	6.2	---	---	---	---	---
Temperature											
55	55	55	55	55	55	55	10	55	97	95	95
Relative Humidity											
---	---	---	---	---	---	---	20 - 80	100	<50	<50	<50

LEGEND:

- PROCESS WATER
- PROCESS AIR
- INSTRUMENT
- SAMPLE PORT
- FLOW DIRECTION
- FM FLOW METER
- FT FLOW RATE TRANSMITTER
- PSL PRESSURE VACUUM LOW
- PT PRESSURE TRANSMITTER
- PI PRESSURE INDICATOR
- LSHH LEVEL SWITCH HIGH HIGH
- LT LEVEL TRANSMITTER
- TT TEMPERATURE TRANSMITTER
- TI TEMPERATURE INDICATOR
- ⑧ PROCESS DESIGNATION
- WSP WATER SAMPLE PORT
- VSP VAPOR SAMPLE PORT

GROUNDWATER INTERIM REMEDIAL MEASURE
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

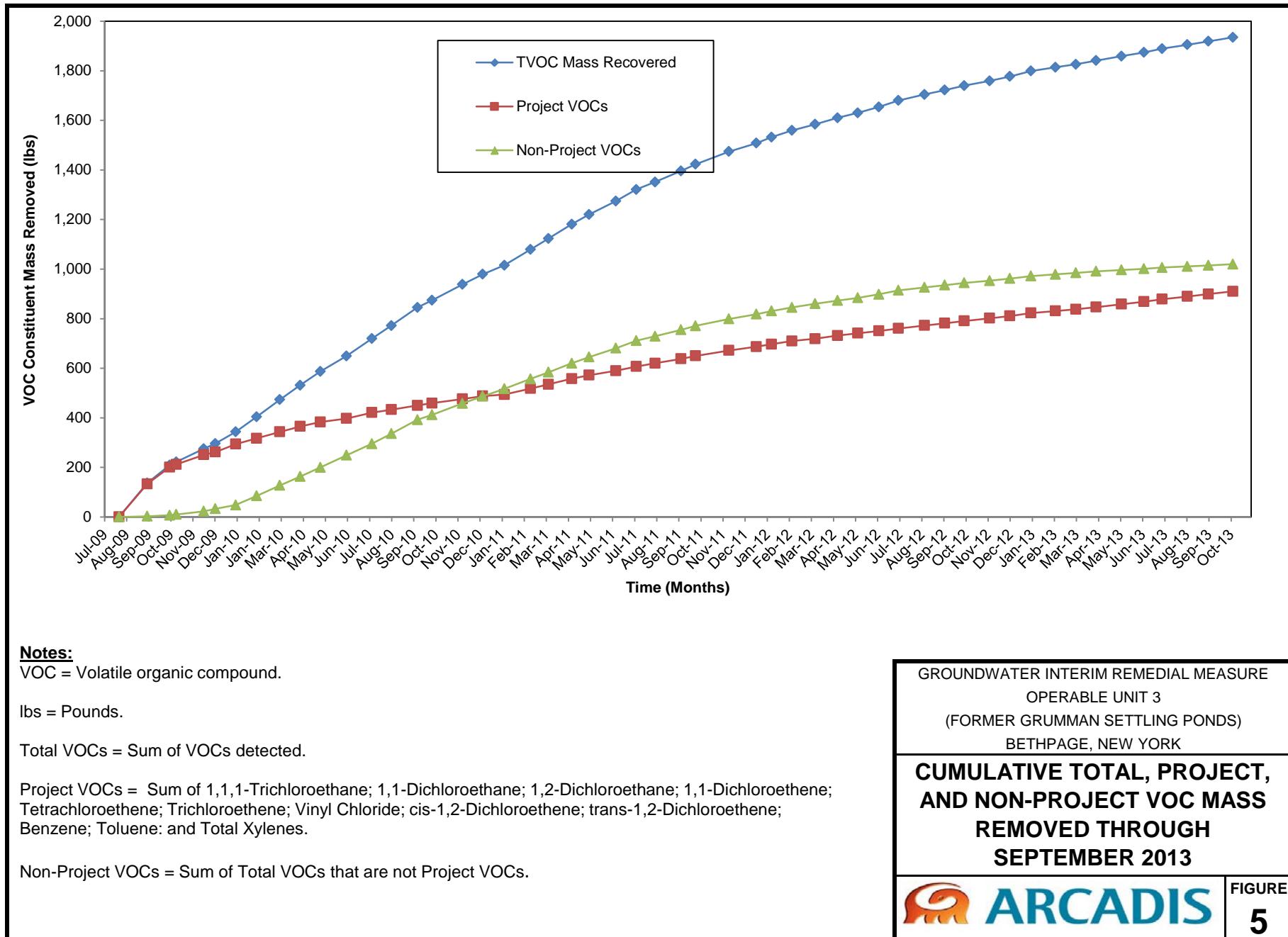
GROUNDWATER TREATMENT SYSTEM PROCESS SCHEMATIC, PROCESS FLOW DIAGRAM, AND MONITORING LOCATIONS



NORTHROP GRUMMAN SYSTEMS CORPORATION
 OPERABLE UNIT 3
 (FORMER GRUMMAN SETTLINGONDS)
 BETHPAGE, NEW YORK

GROUNDWATER MONITORING NETWORK AND
 CONFIGURATION OF THE SHALLOW POTENTIOMETRIC
 SURFACE AND GROUNDWATER FLOW DIRECTIONS
 THIRD QUARTER 2013

FIGURE 4

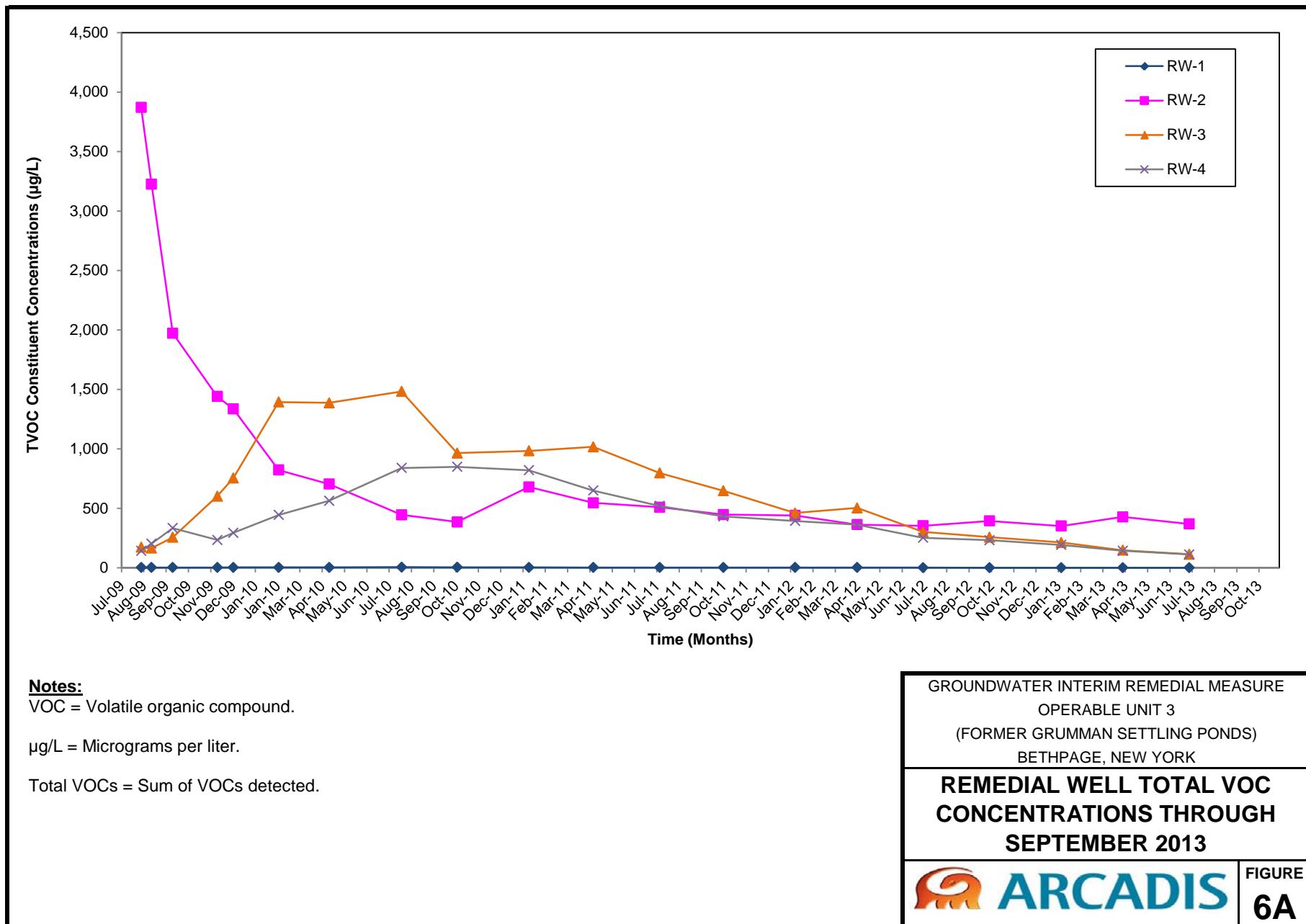


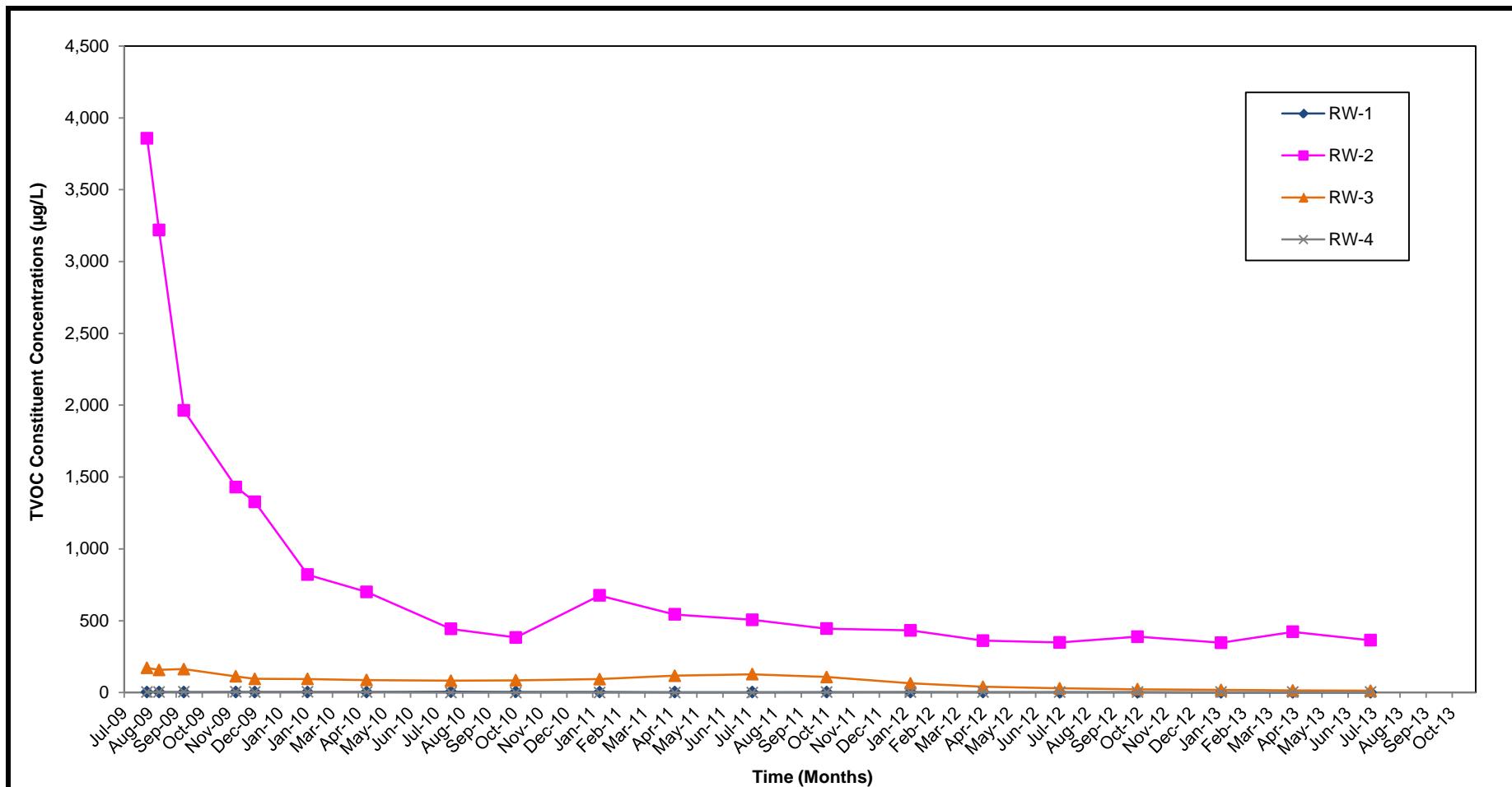
GROUNDWATER INTERIM REMEDIAL MEASURE
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

**CUMULATIVE TOTAL, PROJECT,
AND NON-PROJECT VOC MASS
REMOVED THROUGH
SEPTEMBER 2013**

 ARCADIS

FIGURE
5



**Notes:**

VOC = Volatile organic compound.

µg/L = Micrograms per liter.

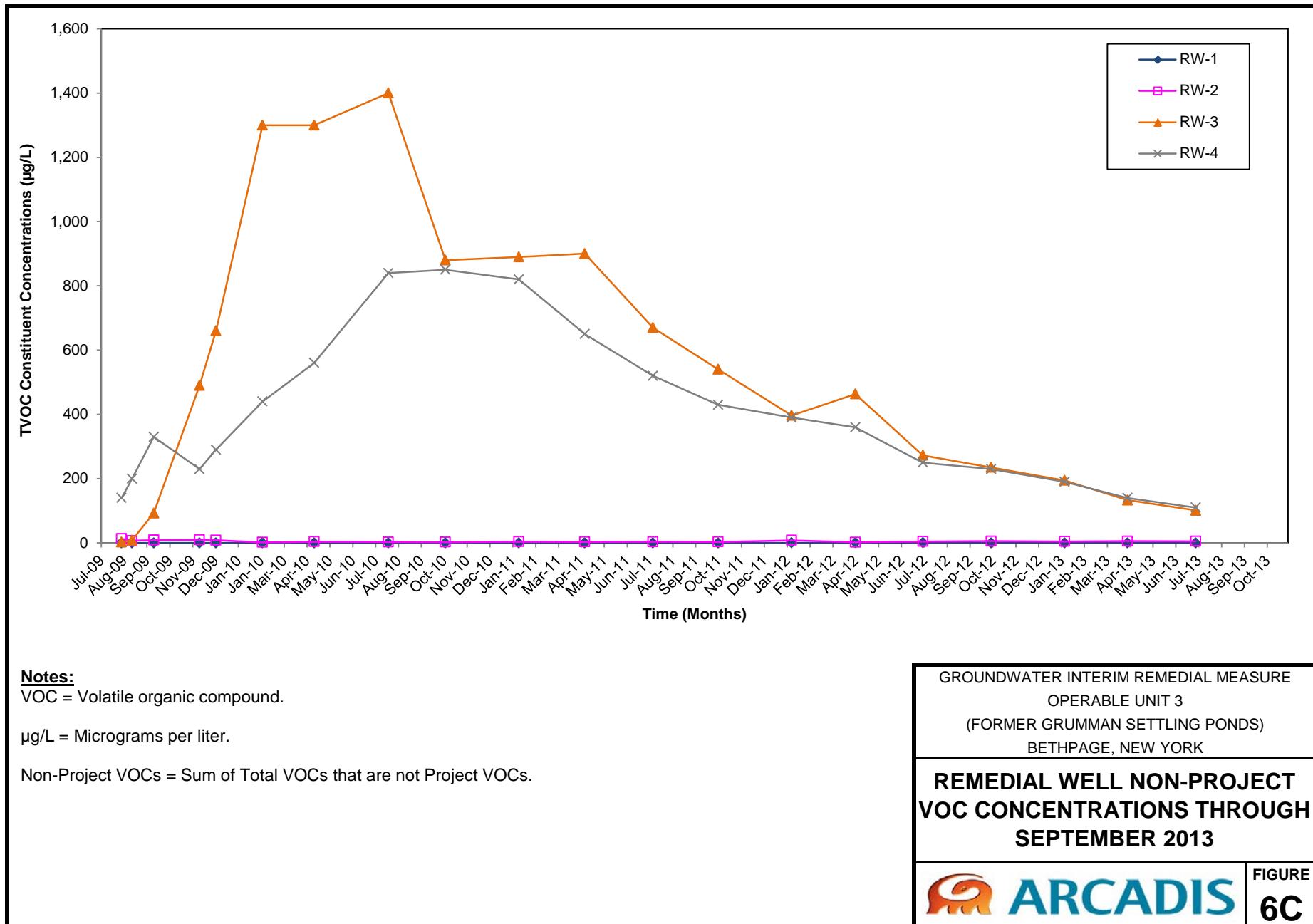
Project VOCs = Sum of 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,2- Dichloroethane; 1,1-Dichloroethene; Tetrachloroethene; Trichloroethene; Vinyl Chloride; cis-1,2-Dichloroethene; trans-1,2-Dichloroethene; Benzene; Toluene; and Total Xylenes.

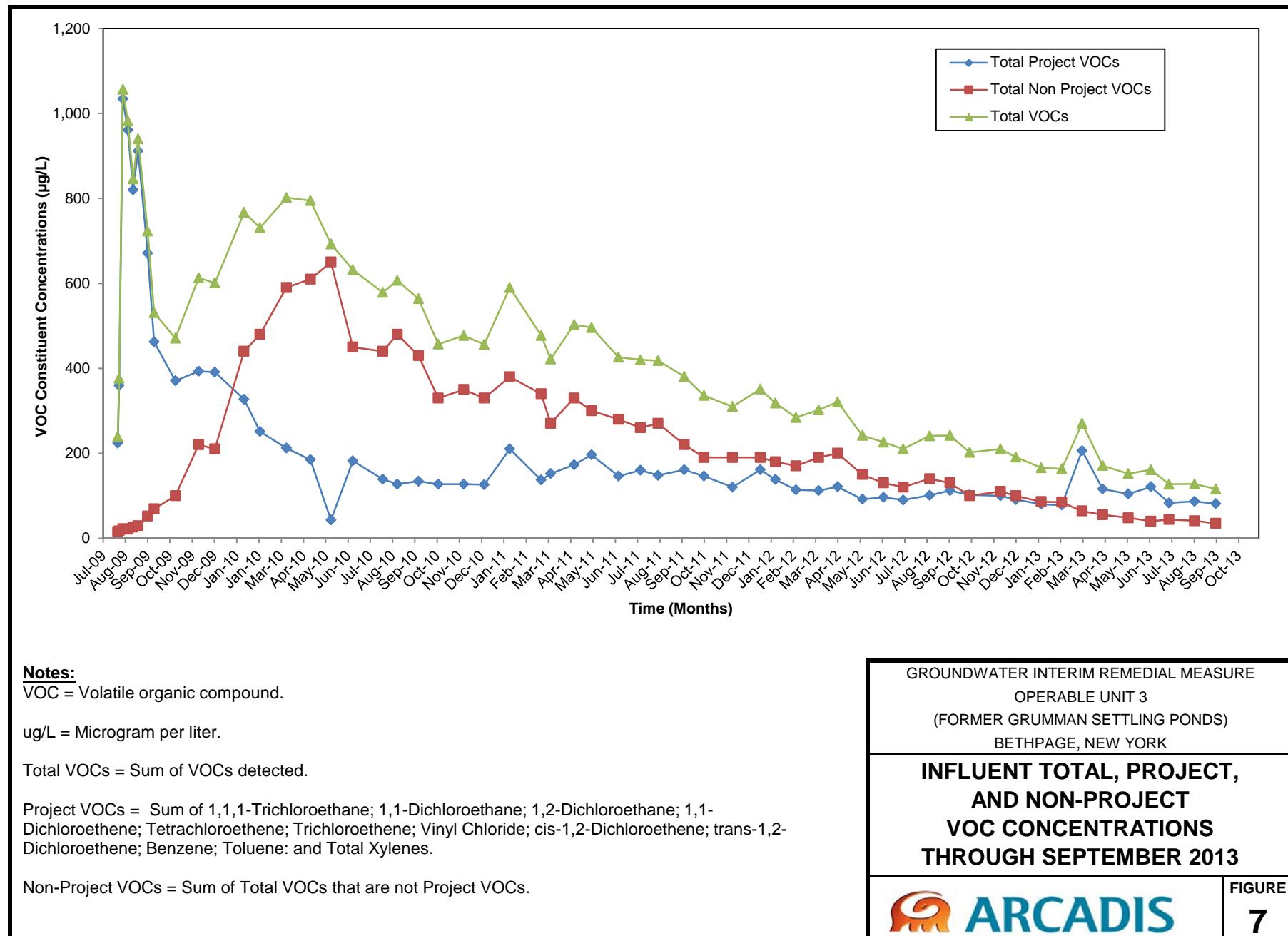
GROUNDWATER INTERIM REMEDIAL MEASURE
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

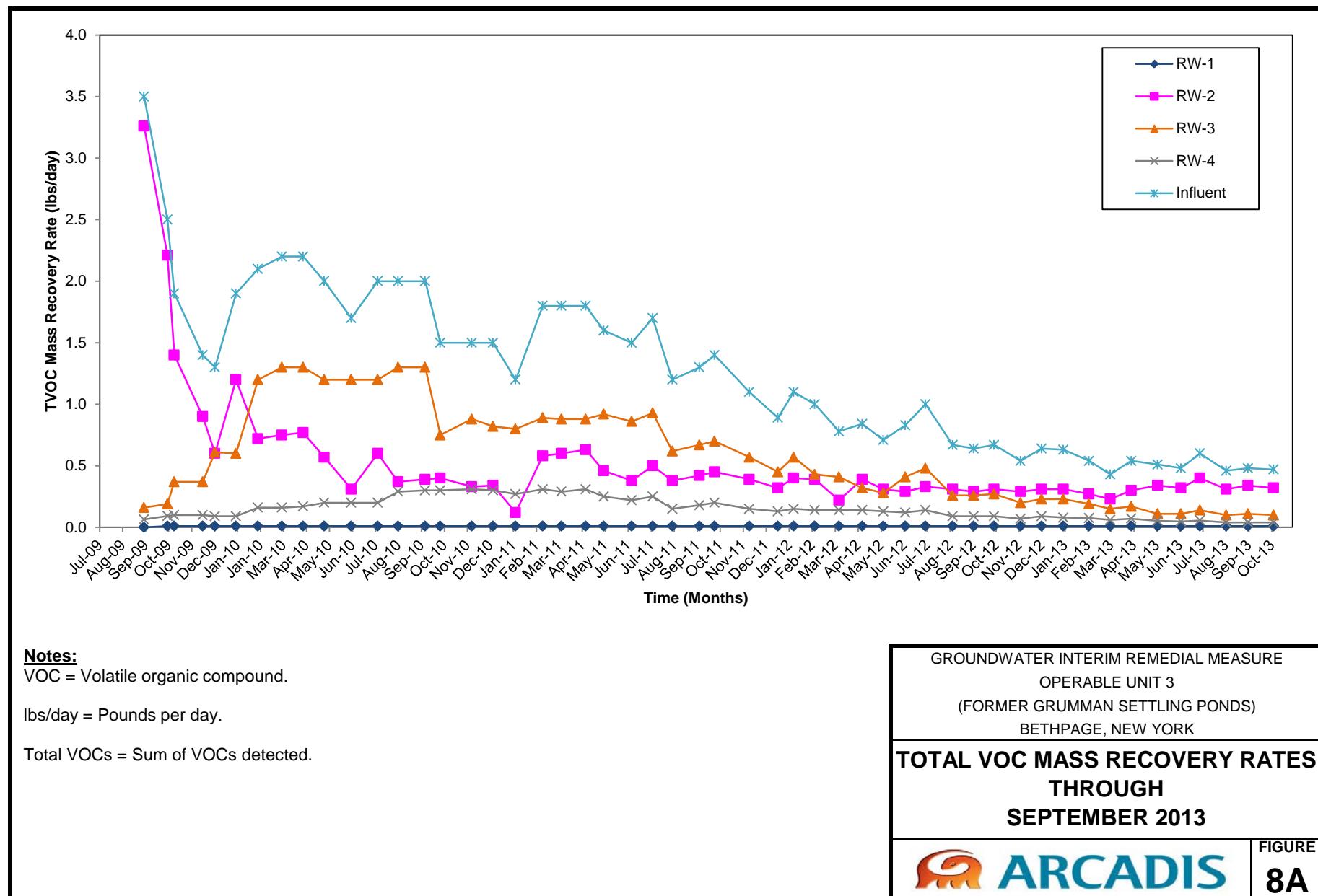
**REMEDIAL WELL PROJECT VOC
CONCENTRATIONS THROUGH
SEPTEMBER 2013**

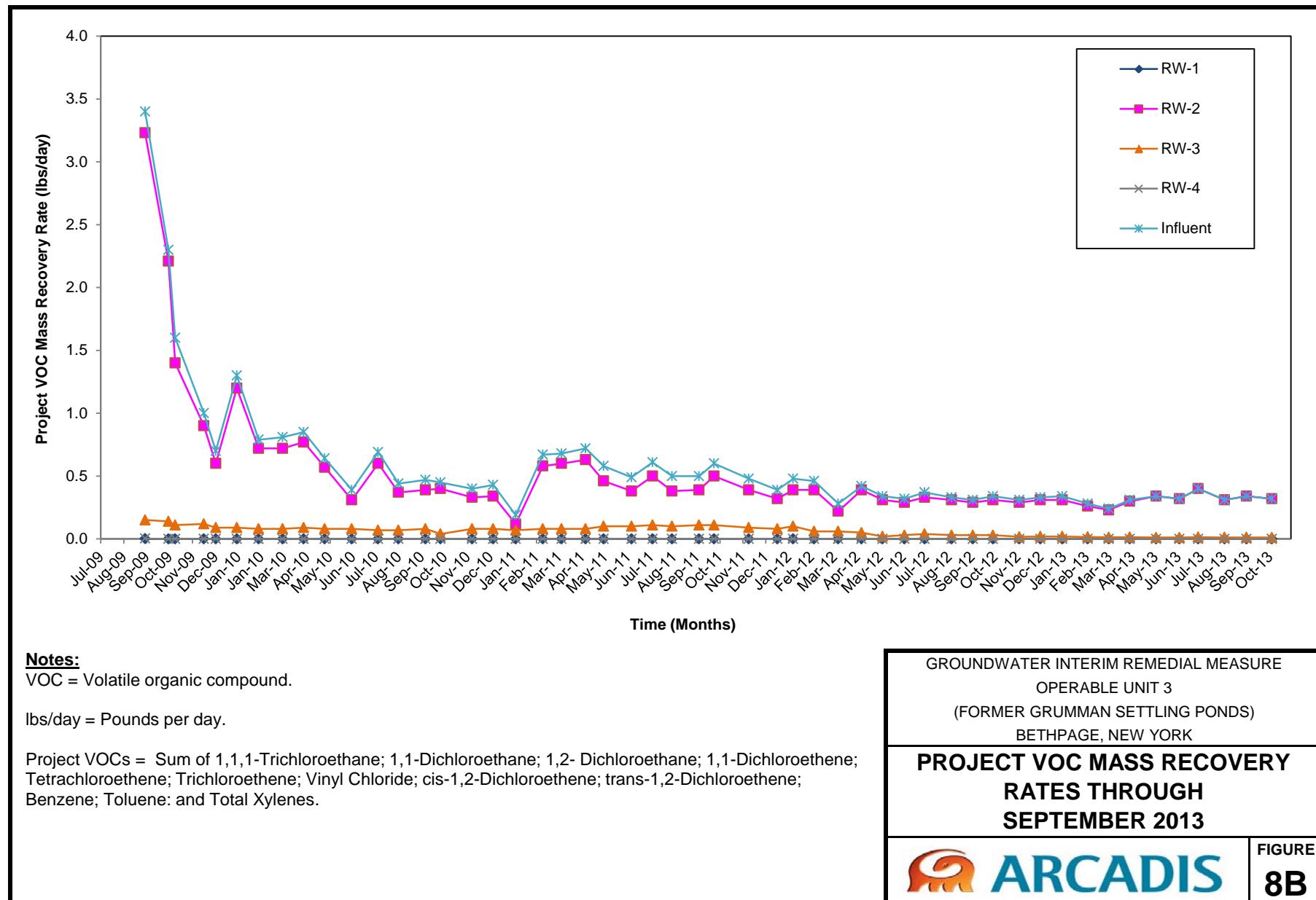


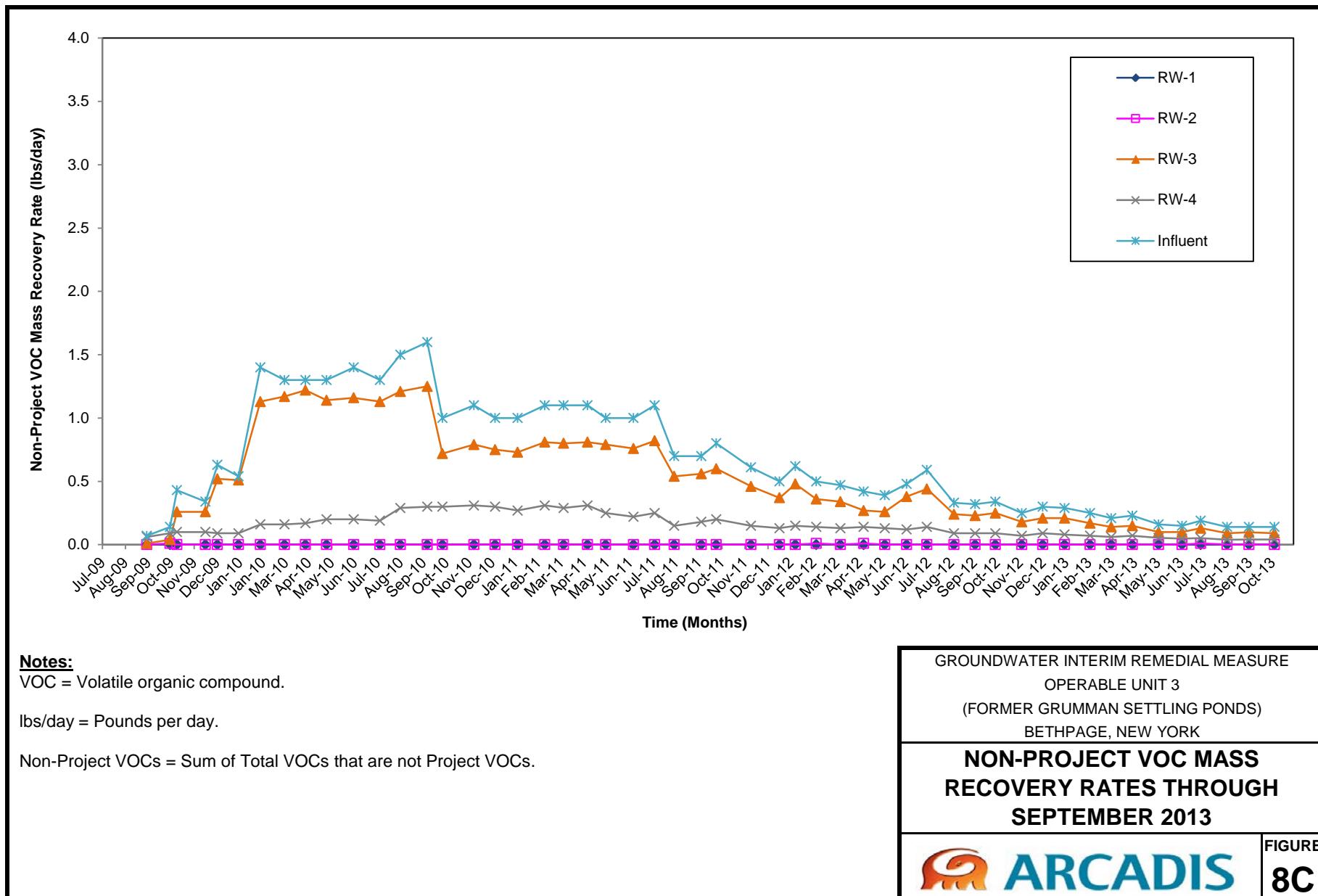
FIGURE
6B

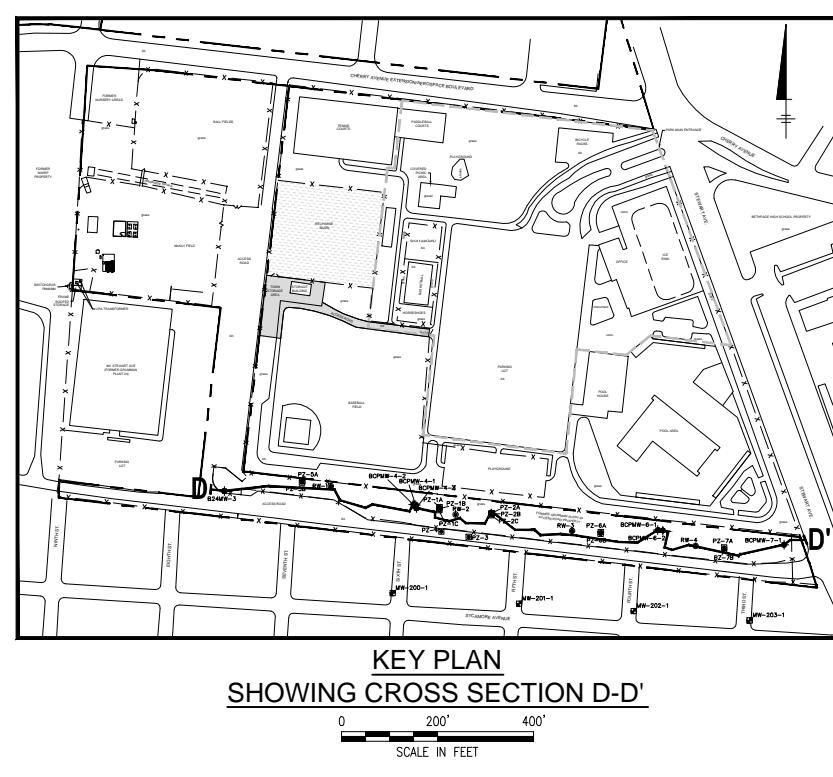
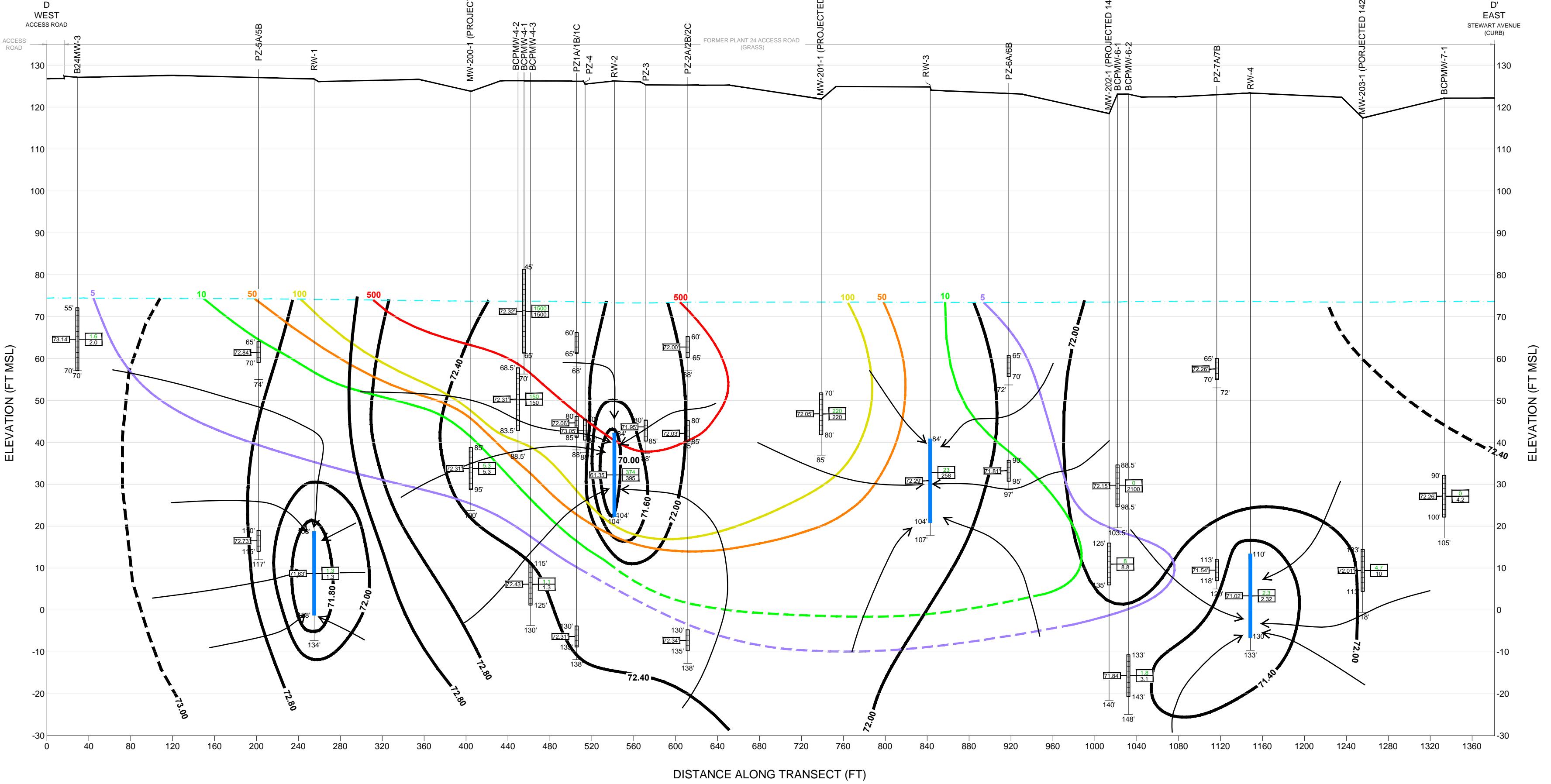














Appendix A

Well Construction Information and
Environmental Effectiveness
Monitoring Program

Table A-1. Well Construction Information and Environmental Effectiveness Monitoring Program, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Northrop Grumman Systems Corporation, Bethpage, New York.^(1,2)

Well ID	Well		Depth to Screen		Screen	Well	Materials	Water Levels ⁽³⁾	MONITORING ACTIVITY		
	Diameter (inches)	Top (ft bsls)	Bottom (ft bsls)	Length (ft)	Depth (ft)	VOC			Cd/Cr	Fe/Mn	
<u>Monitoring Wells</u>											
BCPMW-1	2	50	65	15	65	Sch. 40 PVC	Quarterly	Baseline	Baseline	--	
BCPMW-2	2	60	75	15	75	Sch. 40 PVC	Quarterly	Baseline	Baseline	Baseline	
BCPMW-3	2	59	74	15	74	Sch. 40 PVC	Quarterly	Baseline	Baseline	Baseline	
BCPMW-4-1	4	45	65	20	70	Sch. 40 PVC	Quarterly	Baseline/Semianual ⁽⁵⁾	Baseline/Annual	Baseline	
BCPMW-4-2	4	68.5	83.5	15	88.5	Sch. 40 PVC	Quarterly	Baseline/Semianual ⁽⁵⁾	Baseline/Annual	Baseline	
BCPMW-4-3	4	115	125	10	130	Sch. 40 PVC	Quarterly	Baseline/Semianual ⁽⁵⁾	Baseline/Annual	Baseline	
BCPMW-5-1	4	50	65	15	70	Sch. 80 PVC/ SS	Quarterly	Baseline	Baseline	Baseline	
BCPMW-6-1	4	88.5	98.5	10	103.5	Sch. 40 PVC	Quarterly	Baseline/Semianual ⁽⁵⁾	Baseline/Annual	--	
BCPMW-6-2	4	133	143	10	148	Sch. 40 PVC	Quarterly	Baseline/Semianual ⁽⁵⁾	Baseline/Annual	--	
BCPMW-7-1	4	90	100	10	105	Sch. 40 PVC	Quarterly	Baseline/Semianual ⁽⁵⁾	Baseline/Annual	--	
B24MW-2	2	54	74	20	74	PVC	Quarterly	Baseline/Annual	Baseline	--	
B24MW-3	2	55	70	15	70	PVC	Quarterly	Baseline/Annual	Baseline	--	
B30MW-1	2	57	72	15	72	PVC	Quarterly	Baseline/Annual	Baseline	--	
MW-200-1	4	85	95	10	100	Sch. 40 PVC/ SS	Quarterly	Baseline/Semianual ⁽⁵⁾	Baseline/Annual	--	
MW-201-1	4	70	80	10	85	Sch. 40 PVC/ SS	Quarterly	Baseline/Semianual ⁽⁵⁾	Baseline/Annual	--	
MW-202-1	4	125	135	10	140	Sch. 40 PVC/ SS	Quarterly	Baseline/Semianual ⁽⁵⁾	Baseline/Annual	--	
MW-203-1	4	103	113	10	118	Sch. 40 PVC/ SS	Quarterly	Baseline/Semianual ⁽⁵⁾	Baseline/Annual	--	
<u>Remedial Wells⁽⁶⁾</u>											
RW-01	8	108	128	20	134	Sch. 80 PVC/SS	Quarterly	Baseline/Quarterly	Baseline/Annual	--	
RW-02	6	84	104	20	104	Steel/SS	Quarterly	Baseline/Quarterly	Baseline/Annual	--	
RW-03	8	84	104	20	107	Sch. 80 PVC/SS	Quarterly	Baseline/Quarterly	Baseline/Annual	--	
RW-04	8	110	130	20	133	Sch. 80 PVC/SS	Quarterly	Baseline/Quarterly	Baseline/Annual	--	

See notes on last page.

Table A-1. Well Construction Information and Environmental Effectiveness Monitoring Program, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Northrop Grumman Systems Corporation, Bethpage, New York.^(1,2)

Well ID	Well		Depth to Screen		Screen	Well	Materials	Water Levels ⁽³⁾	MONITORING ACTIVITY		
	Diameter (inches)	Top (ft bsls)	Bottom (ft bsls)	Length (ft)	Depth (ft)	VOC			Cd/Cr	Fe/Mn	
Piezometers											
PZ-01a	2	60	65	5	68	Sch. 40 PVC	Quarterly	--	--	--	
PZ-01b	1	80	85	5	88	Sch. 40 PVC	Quarterly	--	--	--	
PZ-01c	1	130	135	5	138	Sch. 40 PVC	Quarterly	--	--	--	
PZ-02a	2	60	65	5	68	Sch. 40 PVC	Quarterly	--	--	--	
PZ-02b	1	80	85	5	85	Sch. 40 PVC	Quarterly	--	--	--	
PZ-02c	1	130	135	5	138	Sch. 40 PVC	Quarterly	--	--	--	
PZ-03	1	80	85	5	88	Sch. 40 PVC	Quarterly	--	--	--	
PZ-04	1	80	85	5	88	Sch. 40 PVC	Quarterly	--	--	--	
PZ-05a	2	65	70	5	74	Sch. 40 PVC	Quarterly	--	--	--	
PZ-05b	1	110	115	5	117	Sch. 40 PVC	Quarterly	--	--	--	
PZ-06a	2	65	70	5	72	Sch. 40 PVC	Quarterly	--	--	--	
PZ-06b	1	90	95	5	97	Sch. 40 PVC	Quarterly	--	--	--	
PZ-07a	2	65	70	5	72	Sch. 40 PVC	Quarterly	--	--	--	
PZ-07b	1	113	118	5	120	Sch. 40 PVC	Quarterly	--	--	--	

Notes:

- (1) Water samples will be collected and analyzed in accordance with the method and procedures described in the Sampling and Analysis Plan (SAP).
- (2) Approximate locations of the wells and piezometers in the OU-3 Groundwater Interim Remedial Measure Monitoring Program are shown in Figure 1.
- (3) Water levels will be measured in all wells/piezometers during the baseline monitoring event. Water levels will be measured in accordance with the procedures presented in the SAP.
- (4) VOC: VOCs, per Table D-3 in the Quality Assurance Project Plan (QAPP), using NYSDEC ASP 2000 Method OLM 4.3.
- Cd/Cr: Cadmium and Chromium using USEPA Method 6010.
- Fe/Mn: Iron and Manganese using USEPA Method 6010, both total and dissolved.
- (5) Semiannual wells will be monitored annually after Year 1.
- (6) Some of the analyses listed here are also covered in the Remedial System Sampling Program (Table B-1) and some of the analyses and/or frequencies may be modified based on review of short-term and/or long-term testing results. (e.g. the Cd/Cr sampling frequency was changed from quarterly to annually in 2011).

Acronyms\Key:

Sch. 80 PVC	Schedule 80 polyvinyl chloride.
Sch. 40 PVC	schedule 40 polyvinyl chloride.
SS	Stainless steel.
Steel	Low carbon steel.
ft	Feet.
ft ms	Feet relative to mean sea level.
ft bsls	Feet below land surface.
--	Not applicable.
VOC	Volatile organic compound.



Appendix B

Compliance and Performance
Program and Water Sample
Analytical Results

Table B-1. Compliance and Performance Program Elements, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Northrop Grumman Systems Corporation, Bethpage, New York.

Sample Location/Instrument ⁽¹⁾	Parameter (Method) ⁽²⁾	Frequency			SCADA Data Acquisition
		Short-Term ⁽³⁾ (first month)	Long-Term ⁽⁴⁾ (five month period following first month)		
<u>Water Samples</u> ⁽⁵⁾					
Remedial Well 1 (WSP-1)	VOCs (NYSDEC 2000 OLM 4.3)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010) ⁽¹¹⁾	---			
Remedial Well 2 (WSP-2)	VOCs (NYSDEC 2000 OLM 4.3)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010) ⁽¹¹⁾	---			
Remedial Well 3 (WSP-3)	VOCs (NYSDEC 2000 OLM 4.3)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010) ⁽¹¹⁾	---			
Remedial Well 4 (WSP-4)	VOCs (NYSDEC 2000 OLM 4.3)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010) ⁽¹¹⁾	---	Annually	Annually	NA
Air Stripper Influent (WSP-5)	VOCs (NYSDEC 2000 OLM 4.3)	1-hr ⁽⁶⁾ ; Days 1, 3, & Weekly	Monthly	Quarterly	NA
	Iron (USEPA 6010)	1-hr ⁽⁶⁾ ; Days 1, 3, & Weekly	Monthly	Quarterly	NA
Air Stripper Effluent (WSP-6)	Iron (USEPA 6010)	1-hr ⁽⁶⁾ ; As Needed	As Needed	As Needed	NA
Plant Effluent (WSP-7)	VOCs (NYSDEC 2000 OLM 4.3)	1-hr ⁽⁶⁾ ; Days 1, 3, & Weekly	Monthly	Monthly	NA
	Iron (USEPA 6010)	1-hr ⁽⁶⁾ ; Days 1, 3, & Weekly	Monthly	Monthly	NA
	Mercury (USEPA 7470) ⁽⁷⁾	1-hr ⁽⁶⁾ ; Days 1, 3, & Weekly	Monthly	NA	NA
	pH (field) ⁽⁸⁾	1-hr ⁽⁶⁾ ; Days 1, 3, & Weekly	Monthly	Monthly	NA
	Cadmium and Chromium (USEPA 6010) ⁽¹¹⁾	---	Quarterly	Quarterly	NA
<u>Air Samples</u> ⁽⁹⁾⁽¹⁰⁾					
Air Stripper Effluent/ECU-1 Influent (VSP-1)	VOCs (TO-15 Modified)	Monthly	Monthly	Quarterly	NA
ECU-1 Effluent/ECU-2 Influent (VSP-2)	VOCs (TO-15 Modified)	As Needed	As Needed	As Needed	NA
ECU-2 Effluent/ECU-3 Influent (VSP-3)	VOCs (TO-15 Modified)	As Needed	As Needed	As Needed	NA
ECU-3 Effluent/ECU-4 Influent (VSP-4)	VOCs (TO-15 Modified)	As Needed	As Needed	As Needed	NA
Total Effluent (VSP-5)	VOCs (TO-15 Modified)	Monthly	Monthly	Quarterly	NA

See notes on last page.

Table B-1. Compliance and Performance Program Elements, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Northrop Grumman Systems Corporation, Bethpage, New York.

Sample Location/Instrument ⁽¹⁾	Parameter (Method) ⁽²⁾	Frequency		SCADA Data Acquisition
		Short-Term ⁽³⁾ (first month)	Long-Term ⁽⁴⁾ (five month period following first month)	
<u>Water Flow Measurements</u>				
Remedial Well RW-1 (FT - 110)	Flow rate (gpm + total gal.)	(Daily -1st week)	Weekly	Weekly
Remedial Well RW-2 (FT - 120)	Flow rate (gpm + total gal.)	(Daily -1st week)	Weekly	Weekly
Remedial Well RW-3 (FT - 130)	Flow rate (gpm + total gal.)	(Daily -1st week)	Weekly	Weekly
Remedial Well RW-4 (FT - 140)	Flow rate (gpm + total gal.)	(Daily -1st week)	Weekly	Weekly
Combined Influent (FR - 200)	Flow rate (gpm + total gal.)	(Daily -1st week)	Weekly	Weekly
System Effluent (FT-700)	Flow rate (gpm + total gal.)	(Daily -1st week)	Weekly	Weekly
<u>Air Flow Measurements</u>				
Air Stripper Effluent (FT-500)	Flow rate (SCFM)	(Daily -1st week)	Weekly	Weekly
<u>Water Pressure Measurements</u>				
Remedial Well RW-1 (PT - 110)	Pressure (i.w.g.)	(Daily -1st week)	Weekly	Weekly
Remedial Well RW-2 (PT - 120)	Pressure (i.w.g.)	(Daily -1st week)	Weekly	Weekly
Remedial Well RW-3 (PT - 130)	Pressure (i.w.g.)	(Daily -1st week)	Weekly	Weekly
Remedial Well RW-4 (PT - 140)	Pressure (i.w.g.)	(Daily -1st week)	Weekly	Weekly
Air Stripper Effluent (PT-700)	Pressure (i.w.g.)	(Daily -1st week)	Weekly	Weekly
<u>Air Temperature & Relatively Humidity Measurements</u>				
Air Stripper Effluent (TT-500)	Temperature	Weekly	Weekly	Continuously
ECU Mid-Train (TI-503)	Temperature	Weekly	Weekly	NA
Effluent (TI-603)	Temperature	Weekly	Weekly	NA

See notes on last page.

Table B-1. Compliance and Performance Program Elements, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Northrop Grumman Systems Corporation, Bethpage, New York.

Sample Location/Instrument ⁽¹⁾	Parameter (Method) ⁽²⁾	Frequency			SCADA Data Acquisition
		Short-Term ⁽³⁾ (first month)	(five month period following first month)	Long-Term ⁽⁴⁾	
<u>Air Pressure Measurements</u>					
Air Stripper Effluent (PT-500)	Pressure (i.w.g.)	(Daily -1st week)	Weekly	Monthly	Quarterly
ECU #1 Influent (PI-501)	Pressure (i.w.g.)	(Daily -1st week)	Weekly	Monthly	Quarterly
ECU #2 Influent (PI-502)	Pressure (i.w.g.)	(Daily -1st week)	Weekly	Monthly	Quarterly
ECU #3 Influent (PI-601)	Pressure (i.w.g.)	(Daily -1st week)	Weekly	Monthly	Quarterly
ECU #4 Influent (PI-602)	Pressure (i.w.g.)	(Daily -1st week)	Weekly	Monthly	Quarterly
System Effluent (PI-603)	Pressure (i.w.g.)	(Daily -1st week)	Weekly	Monthly	Quarterly

See notes on last page.

Table B-1. Compliance and Performance Program Elements, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Northrop Grumman Systems Corporation, Bethpage, New York.

Notes:

- (1) Refer to Figure 3 of this Operation, Maintenance, & Monitoring (OM&M) Report and Appendix E of the Groundwater IRM OM&M Manual (OM&M Manual (ARCADIS 2009)) for a diagram showing referenced sample locations and measurement points.
- (2) Parameters/methods may be modified based on review of short-term and/or long-term testing results. Parameters shown in **Bold** indicate parameters that require NYSDEC notification/approval prior to change in monitoring schedule.
- (3) Short-term schedule is tentative. Modification may be required/recommended based on the results of start-up and performance testing.
- (4) Long-term schedule is tentative. Modification may be required/recommended based on the results of short-term testing or water quality trends.
- (5) Water samples will be collected in accordance with the methods described in the Sampling and Analysis Plan, which is included as Appendix A of the OM&M Manual (ARCADIS 2009). Samples will be analyzed in accordance with the methods and procedures described in the Sampling and Analysis Plan.
- (6) Per NYSDEC request, a 1-hr pilot test was performed during system shake-down. The 1-hr pilot test samples were also analyzed for Mercury (Hg).
- (7) Per the interim treated effluent (water) discharge criteria provided in the NYSDEC letter dated March 19, 2009, select samples were analyzed for Mercury (Hg).
- (8) As authorized by the NYSDEC, the pH monitoring frequency was reduced from weekly to monthly beginning on February 8, 2010.
- (9) Air samples collected and analyzed in accordance with methods described in the Sampling and Analysis Plan, which is included as Appendix A of the OM&M Manual (ARCADIS 2009).
- (10) Additional air samples will be collected to help calculate media usage rates and to help determine media changeout frequencies.
- (11) Cadmium and Chromium analyses are part of the Environmental Effectiveness Monitoring Program (Table A-1) and the original discharge permit application. They are included here for consistency.

Acronyms\Key:

NA	Not Applicable.
---	Not Required
ECU	Emissions control unit.
VOCs	Volatile organic compounds (refer Tables D-3 and D-5 in the Quality Assurance Project Plan (QAPP) (Appendix D of the OM&M Manual (ARCADIS 2009)) for the analyte lists for aqueous and air samples, respectively).
gal.	Gallons.
gpm	Gallons per minute.
i.w.g.	Inches water gauge.
NYSDEC	New York State Department of Environmental Conservation.
EPA	U.S. Environmental Protection Agency.
SCADA	Supervisory Control And Data Acquisition.
OM&M	Operation, maintenance and monitoring.

Table B-2. Water Sample Analytical Results - July 1, 2013, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/L)	Sample ID: Sample Location: Sample Date:	WSP-01 RW-1 7/1/2013	WSP-02 RW-2 7/1/2013	WSP-03 RW-3 7/1/2013	WSP-04 RW-4 7/1/2013	WSP-05 Influent 7/1/2013	WSP-07 Effluent 7/1/2013
Volatile Organic Compounds							
1,1,1-Trichloroethane	< 5.0 U	0.27 J	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2,2-Tetrachloroethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2-trichloro-1,2,2-trifluoroethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2-Trichloroethane	< 5.0 U	1.5 J	0.21 J	0.45 J	0.46 J	< 5.0 U	< 5.0 U
1,1-Dichloroethane	< 5.0 U	0.77 J	< 5.0 U	< 5.0 U	0.24 J	< 5.0 U	< 5.0 U
1,1-Dichloroethene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloroethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloropropane	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
2-Butanone	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
4-Methyl-2-Pentanone	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
Acetone	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	1.5 J
Benzene	< 0.70 U	< 0.70 U	< 0.70 U	< 0.70 U	< 0.70 U	< 0.70 U	< 0.70 U
Bromodichloromethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Bromomethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Disulfide	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Tetrachloride	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
CFC-11	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
CFC-12	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chlorobenzene	< 5.0 U	< 5.0 U	98	110	44	< 5.0 U	< 5.0 U
Chlorodibromomethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chlorodifluoromethane	< 5.0 U	2.2 J	3.6 J	0.36 J	1.7 J	< 5.0 U	< 5.0 U
Chloroethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chloroform	0.24 J	140	7.7	< 5.0 U	31	< 5.0 U	< 5.0 U
Chloromethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
cis-1,2-Dichloroethene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
cis-1,3-Dichloropropene	< 5.0 U	3.1 J	< 5.0 U	< 5.0 U	0.71 J	< 5.0 U	< 5.0 U
Dichloromethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Ethylbenzene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	0.30 J	< 5.0 U	< 5.0 U
m,p-Xylene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Methyl N-Butyl Ketone	< 5.0 U	0.33 J	0.38 J	1.1 J	0.35 J	< 5.0 U	< 5.0 U
Methyl-Tert-Butylether	< 5.0 U	95	< 5.0 U	< 5.0 U	22	< 5.0 U	< 5.0 U
o-Xylene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Styrene (Monomer)	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Tetrachloroethene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Toluene	0.77 J	17	4.5 J	0.67 J	5.3	< 5.0 U	< 5.0 U
trans-1,2-Dichloroethene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
trans-1,3-Dichloropropene	< 5.0 U	< 5.0 U	0.30 J	0.39 J	< 5.0 U	< 5.0 U	< 5.0 U
Tribromomethane	< 2.0 U	100	< 2.0 U	< 2.0 U	22	< 2.0 U	< 2.0 U
Trichloroethene	< 5.0 U	5.6	< 5.0 U	< 5.0 U	1.0 J	< 5.0 U	< 5.0 U
Vinyl Chloride	< 5.0 U	3.1 J	< 5.0 U	< 5.0 U	0.71 J	< 5.0 U	< 5.0 U
Subtotal VOCs ⁽⁴⁾	1.0	369	115	113	129	1.5	
Tentatively Identified Compounds	ND	ND	ND	ND	ND	ND	
Subtotal TICs ⁽⁵⁾	0	0	0	0	0	0	
Total VOCs ⁽⁶⁾	1.0	369	115	113	129	1.5	

See notes on last page.

Table B-2. Water Sample Analytical Results - July 1, 2013, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/L)	Sample ID: Sample Location: Sample Date:	WSP-01 RW-1 7/1/2013	WSP-02 RW-2 7/1/2013	WSP-03 RW-3 7/1/2013	WSP-04 RW-4 7/1/2013	WSP-05 Influent 7/1/2013	WSP-07 Effluent 7/1/2013
Metals							
Cadmium (Dissolved)	--	--	--	--	--	--	< 5.0 U
Cadmium (Total)	--	--	--	--	--	--	< 5.0 U
Chromium (Dissolved)	--	--	--	--	--	--	< 10 U
Chromium (Total)	--	--	--	--	--	--	< 10 U
Iron (Dissolved)	--	650	< 100 U	--	150	160	
Iron (Total)	--	1200	180	--	520	220	
Manganese (Dissolved)	--						
Manganese (Total)	--	--	--	--	--	--	--
Mercury (Dissolved)	--						
Mercury (Total)	--	--	--	--	--	--	< 0.20 U

Notes:

- (1) Samples collected by ARCADIS on the dates shown and submitted to ALS Environmental for VOC analyses using New York State Department of Environmental Conservation ASP 2005 Method OLM 4.3 and metals using USEPA Method 6010C, except for mercury, which was analyzed using USEPA Method 7470A.
- (2). Refer to Figure 3 of this OM&M Report for schematic sample locations.
- (3). Results validated following protocols specified in the Sampling and Analysis Plan (Appendix A) of the Groundwater OM&M Manual (ARCADIS 2009).
- (4) "Subtotal VOCs" represents the sum of individual concentrations of VOCs detected. Values shown have been rounded to the nearest whole number.
- (5) "Subtotal TICs" represents the sum of individual TICs detected. Values shown have been rounded to the nearest whole number.
- (6) "Total VOCs" represent the sum of VOCs and TICs detected. Values shown have been rounded to the nearest whole number.

Acronyms\Key:

Bold value indicates a detection.

D	Compound reported from the diluted analysese as the concentration in the initial analysis was outside the calibration range.
dup.	Duplicate.
J	Estimated value.
ND	TIC not detected.
OM&M	Operation, maintenance and monitoring.
TIC	Tentatively identified compound.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
ug/L	Micrograms per liter.
--	Not analyzed.
< 5 U	Compound not detected above its laboratory quantification limit.

Table B-3. Water Sample Analytical Results - August 5, 2013, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/L)	Sample ID: Sample Location: Sample Date:	WSP-05 Influent 8/5/2013	WSP-05 Dup. Influent 8/5/2013	WSP-07 Effluent 8/5/2013
Volatile Organic Compounds				
1,1,1-Trichloroethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2,2-Tetrachloroethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2-trichloro-1,2,2-trifluoroethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2-Trichloroethane	0.41 J	0.47 J	< 5.0 U	< 5.0 U
1,1-Dichloroethane	0.23 J	0.27 J	< 5.0 U	< 5.0 U
1,1-Dichloroethene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloroethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloropropane	< 50 U	< 50 U	< 50 U	< 50 U
2-Butanone	< 50 U	< 50 U	< 50 U	< 50 U
4-Methyl-2-Pentanone	< 50 U	< 50 U	< 50 U	< 50 U
Acetone	< 50 U	< 50 U	< 50 U	< 50 U
Benzene	< 0.70 U	< 0.70 U	< 0.70 U	< 0.70 U
Bromodichloromethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Bromomethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Disulfide	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Tetrachloride	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
CFC-11	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
CFC-12	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chlorobenzene	41	42	< 5.0 U	< 5.0 U
Chlorodibromomethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chlorodifluoromethane	1.5 J	1.6 J	< 5.0 U	< 5.0 U
Chloroethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chloroform	33	34	< 5.0 U	< 5.0 U
Chloromethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
cis-1,2-Dichloroethene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
cis-1,3-Dichloropropene	0.61 J	0.69 J	< 5.0 U	< 5.0 U
Dichloromethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Ethylbenzene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
m,p-Xylene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Methyl N-Butyl Ketone	0.27 J	0.30 J	< 5.0 U	< 5.0 U
Methyl-Tert-Butylether	20	20	< 5.0 U	< 5.0 U
o-Xylene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Styrene (Monomer)	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Tetrachloroethene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Toluene	5.7	5.7	< 5.0 U	< 5.0 U
trans-1,2-Dichloroethene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
trans-1,3-Dichloropropene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Tribromomethane	25	26	< 2.0 U	< 2.0 U
Trichloroethene	1.4 J	1.6 J	< 5.0 U	< 5.0 U
Vinyl Chloride	0.69 J	0.85 J	< 5.0 U	< 5.0 U
Subtotal VOCs ⁽⁴⁾	130	133.48	0	
Tentatively Identified Compounds	ND	ND	ND	
Subtotal TICs ⁽⁵⁾	0	0	0	
Total VOCs ⁽⁶⁾	130	133	0	

See notes on last page.

Table B-3. Water Sample Analytical Results - August 5, 2013, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.^(1,2,3)

COMPOUND (ug/L)	Sample ID: Sample Location: Sample Date:	WSP-05 Influent 8/5/2013	WSP-05 Dup. Influent 8/5/2013	WSP-07 Effluent 8/5/2013
Metals				
Cadmium (Dissolved)	--	--	--	--
Cadmium (Total)	--	--	--	--
Chromium (Dissolved)	--	--	--	--
Chromium (Total)	--	--	--	--
Iron (Dissolved)	290	--	280	--
Iron (Total)	1030	--	390	--
Manganese (Dissolved)	--	--	--	--
Manganese (Total)	--	--	--	--
Mercury (Dissolved)	--	--	--	--
Mercury (Total)	--	--	< 0.20 U	--

Notes:

- (1) Samples collected by ARCADIS on the dates shown and submitted to ALS Environmental for VOC analyses using New York State Department of Environmental Conservation ASP 2005 Method OLM 4.3 and metals using USEPA Method 6010C, except for mercury, which was analyzed using USEPA Method 7470A.
- (2) Refer to Figure 3 of this OM&M Report for schematic sample locations.
- (3) Results validated following protocols specified in the Sampling and Analysis Plan (Appendix A) of the Groundwater OM&M Manual (ARCADIS 2009).
- (4) "Subtotal VOCs" represents the sum of individual concentrations of VOCs detected. Values shown have been rounded to the nearest whole number.
- (5) "Subtotal TICs" represents the sum of individual TICs detected. Values shown have been rounded to the nearest whole number.
- (6) "Total VOCs" represent the sum of VOCs and TICs detected. Values shown have been rounded to the nearest whole number.

Acronyms Key:

Bold value indicates a detection.

D	Compound reported from the diluted analysese as the concentration in the initial analysis was outside the calibration range.
dup.	Duplicate.
J	Estimated value.
ND	TIC not detected.
OM&M	Operation, maintenance and monitoring.
TIC	Tentatively identified compound.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
ug/L	Micrograms per liter.
--	Not analyzed.
< 5 U	Compound not detected above its laboratory quantification limit.

Table B-4. Water Sample Analytical Results - September 3, 2013, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/L)	Sample ID: Sample Location: Sample Date:	WSP-05 Influent 9/3/2013	WSP-07 Effluent 9/3/2013
<u>Volatile Organic Compounds</u>			
1,1,1-Trichloroethane	< 5.0 U	< 5.0 U	
1,1,2,2-Tetrachloroethane	< 5.0 U	< 5.0 U	
1,1,2-trichloro-1,2,2-trifluoroethane	< 5.0 U	< 5.0 U	
1,1,2-Trichloroethane	0.41 J	< 5.0 U	
1,1-Dichloroethane	0.20 J	< 5.0 U	
1,1-Dichloroethene	< 5.0 U	< 5.0 U	
1,2-Dichloroethane	< 5.0 U	< 5.0 U	
1,2-Dichloropropane	< 50 U	< 50 U	
2-Butanone	< 50 U	< 50 U	
4-Methyl-2-Pentanone	< 50 U	< 50 U	
Acetone	< 50 U	< 50 U	
Benzene	< 0.70 U	< 0.70 U	
Bromodichloromethane	< 5.0 U	< 5.0 U	
Bromomethane	< 5.0 U	< 5.0 U	
Carbon Disulfide	< 5.0 U	< 5.0 U	
Carbon Tetrachloride	< 5.0 U	< 5.0 U	
CFC-11	< 5.0 U	< 5.0 U	
CFC-12	< 5.0 U	< 5.0 U	
Chlorobenzene	35	< 5.0 U	
Chlorodibromomethane	< 5.0 U	< 5.0 U	
Chlorodifluoromethane	1.3 J	< 5.0 U	
Chloroethane	< 5.0 U	< 5.0 U	
Chloroform	30	< 5.0 U	
Chloromethane	< 5.0 U	< 5.0 U	
cis-1,2-Dichloroethene	< 5.0 U	< 5.0 U	
cis-1,3-Dichloropropene	0.68 J	< 5.0 U	
Dichloromethane	< 5.0 U	< 5.0 U	
Ethylbenzene	< 5.0 U	< 5.0 U	
m,p-Xylene	< 5.0 U	< 5.0 U	
Methyl N-Butyl Ketone	0.33 J	< 5.0 U	
Methyl-Tert-Butylether	21	< 5.0 U	
o-Xylene	< 5.0 U	< 5.0 U	
Styrene (Monomer)	< 5.0 U	< 5.0 U	
Tetrachloroethene	< 5.0 U	< 5.0 U	
Toluene	4.8 J	< 5.0 U	
trans-1,2-Dichloroethene	< 5.0 U	< 5.0 U	
trans-1,3-Dichloropropene	< 5.0 U	< 5.0 U	
Tribromomethane	22	< 2.0 U	
Trichloroethene	1.5 J	< 5.0 U	
Vinyl Chloride	0.84 J	< 5.0 U	
Subtotal VOCs ⁽⁴⁾	118	0.0	
Tentatively Identified Compounds	ND	ND	
Subtotal TICs ⁽⁵⁾	0.0	0.0	
Total VOCs ⁽⁶⁾	118	0.0	

See notes on last page.

Table B-4. Water Sample Analytical Results - September 3, 2013, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/L)	Sample ID: Sample Location: Sample Date:	WSP-05 Influent 9/3/2013	WSP-07 Effluent 9/3/2013
Metals			
Cadmium (Dissolved)	--	--	
Cadmium (Total)	--	--	
Chromium (Dissolved)	--	--	
Chromium (Total)	--	--	
Iron (Dissolved)	220	180	
Iron (Total)	350	350	
Manganese (Dissolved)	--	--	
Manganese (Total)	--	--	
Mercury (Dissolved)	--	--	
Mercury (Total)	--	< 0.20 U	

Notes:

- (1) Samples collected by ARCADIS on the dates shown and submitted to ALS Environmental for VOC analyses using New York State Department of Environmental Conservation ASP 2005 Method OLM 4.3 and metals using USEPA Method 6010C, except for mercury, which was analyzed using USEPA Method 7470A.
- (2) Refer to Figure 3 of this OM&M Report for schematic sample locations.
- (3) Results validated following protocols specified in the Sampling and Analysis Plan (Appendix A) of the Groundwater OM&M Manual (ARCADIS 2009).
- (4) "Subtotal VOCs" represents the sum of individual concentrations of VOCs detected. Values shown have been rounded to the nearest whole number.
- (5) "Subtotal TICs" represents the sum of individual TICs detected. Values shown have been rounded to the nearest whole number.
- (6) "Total VOCs" represent the sum of VOCs and TICs detected. Values shown have been rounded to the nearest whole number.

Acronyms\Key:

Bold value indicates a detection.

D	Compound reported from the diluted analyses as the concentration in the initial analysis was outside the calibration range.
dup.	Duplicate.
J	Estimated value.
ND	TIC not detected.
OM&M	Operation, maintenance and monitoring.
TIC	Tentatively identified compound.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
ug/L	Micrograms per liter.
--	Not analyzed.
< 5 U	Compound not detected above its laboratory quantification limit.



Appendix C

Vapor Sample Analytical Results

Table C-1. Vapor Sample Analytical Results - July 1, 2013, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.^(1,2,3)

COMPOUND (ug/m ³)	Location ID: Sample Location: Sample Date:	VSP-1 Influent 7/1/2013	VSP-05 Effluent 7/1/2013
Volatile Organic Compounds			
1,1,1-Trichloroethane	< 1.5 U	< 0.78 U	
1,1,2,2-Tetrachloroethane	< 1.5 U	< 0.78 U	
1,1,2-trichloro-1,2,2-trifluoroethane	2.8	< 0.78 U	
1,1,2-Trichloroethane	< 1.5 U	< 0.78 U	
1,1-Dichloroethane	6.8	1.6	
1,1-Dichloroethene	3.2	< 0.78 U	
1,2-Dichloroethane	< 1.5 U	< 0.78 U	
1,2-Dichloropropane	< 1.5 U	< 0.78 U	
1,3-Butadiene	< 1.5 U	< 0.78 U	
1-Chloro-1,1-difluoroethane	< 1.5 U	< 0.78 U	
2-Butanone	< 15 U	< 7.8 U	
4-Methyl-2-Pentanone	< 1.5 U	< 0.78 U	
Acetone	< 15 U	97	
Benzene	< 1.5 U	1.7	
Bromodichloromethane	< 1.5 U	< 0.78 U	
Bromomethane	< 1.5 U	< 0.78 U	
Carbon Disulfide	< 15 U	< 7.8 U	
Carbon Tetrachloride	< 1.5 U	< 0.78 U	
CFC-11	< 1.5 U	< 0.78 U	
CFC-12	2.6	2.7	
Chlorobenzene	< 1.5 U	< 0.78 U	
Chlorodibromomethane	< 1.5 U	< 0.78 U	
Chlorodifluoromethane	540 D	520 D	
Chloroethane	< 1.5 U	< 0.78 U	
Chloroform	27	2.8	
Chloromethane	< 1.5 U	< 0.78 U	
cis-1,2-Dichloroethene	570 D	25	
cis-1,3-Dichloropropene	< 1.5 U	< 0.78 U	
Dichloromethane	< 1.5 U	< 0.78 U	
Ethylbenzene	13	< 0.78 U	
m,p-Xylene	26	< 1.6 U	
Methyl N-Butyl Ketone	< 1.5 U	< 0.78 U	
Methyl-Tert-Butylether	< 1.5 U	< 0.78 U	
o-Xylene	15	< 0.78 U	
Styrene (Monomer)	< 1.5 U	< 0.78 U	
Tetrachloroethene	4.3	< 0.78 U	
Toluene	380 D	20	
trans-1,2-Dichloroethene	< 1.5 U	< 0.78 U	
trans-1,3-Dichloropropene	< 1.5 U	< 0.78 U	
Tribromomethane	< 1.5 U	< 0.78 U	
Trichloroethene	78	2	
Vinyl Chloride	290	50	
Sum of Detections (ignore if ND)	1,959	723	

See notes on last page.

Table C-1. Vapor Sample Analytical Results - July 1, 2013, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York. ^(1,2,3)

COMPOUND (ug/m ³)	Location ID: Sample Location: Sample Date:	VSP-1 Influent 7/1/2013	VSP-05 Effluent 7/1/2013
Tentatively Identified Compounds			
2-Phenyl-2-Propanol		200 JN	170 JN
Acetic acid		--	110 JN
Acetophenone		35 JN	58 JN
Hexamethylcyclotrisiloxane		19 JN	98 JN
Hydroxypropyl Methacrylate Isomer		74 JN	--
Methoxy-phenyl-oxime		--	31 JN
Methyl styrene (alpha)		33 JN	--
N-Dodecane		--	69 JN
N-Undecane		--	80 JN
Pentyl-Cyclohexane		--	59 JN
Propylene Glycol		39 JN	--
Unknown		38 JN	84 JN
Unknown		--	40 JN
Unknown C11H20 Compound		--	85 JN
Unknown C12H26 Branched Alkane		--	130 JN
Unknown C12H26 Branched Alkane		--	89 JN
Unknown C12H26 Branched Alkane		--	75 JN
Unknown C12H26 Branched Alkane		--	74 JN
Unknown C12H26 Branched Alkane		--	69 JN
Unknown C12H26 Branched Alkane		--	54 JN
Unknown C12H26 Branched Alkane		--	52 JN
Unknown C13H28 Branched Alkane		--	88 JN
Unknown C13H28 Branched Alkane		--	35 JN
Subtotal TICs ⁽⁵⁾		438	1,550
Total VOCs ⁽⁶⁾		2,397	2,273

See notes on last page.

Table C-1. Vapor Sample Analytical Results - July 1, 2013, Groundwater Interim Remedial Measure, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York.^(1,2,3)

Notes:

- (1) Samples collected by ARCADIS on the dates shown and submitted to ALS Environmental for VOC analyses per Modified USEPA Method TO-15.
- (2) Refer to Figure 3 of this OM&M Report for schematic sample locations.
- (3) Results validated following protocols specified in the Sampling and Analysis Plan (Appendix A) of the Groundwater OM&M (ARCADIS 2009).
- (4) "Subtotal VOCs" represents the sum of individual concentrations of VOCs detected. Values shown have been rounded to the nearest whole number.
- (5) "Subtotal TICs" represents the sum of individual top 20 TICs detected. Values shown have been rounded to the nearest whole number.
- (6) "Total VOCs" represent the sum of VOCs and TICs detected. Values shown have been rounded to the nearest whole number.

Acronyms\Key:

Bold value indicates a detection.

D	Concentration is based on a diluted sample analysis.
IRM	Interim Remedial Measure.
JN	Compound tentatively identified, concentration is estimated.
OM&M	Operation, maintenance and monitoring.
NYSDEC	New York State Department of Environmental Conservation.
TIC	Tentatively identified compound.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
ug/m ³	Micrograms per cubic meter.
< 1.5 U	Compound not detected above its laboratory quantification limit.
--	TIC not detected.



Appendix D

Air Discharge Quality Evaluation

Table D-1. Annual Summary of SCREEN3 Model Input and Outputs, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.

Parameters	Date Sampled:	07/05/12	10/03/12	12/03/12	02/04/13	04/01/13	07/01/13
SCREEN3 Model Input							
Source Type	Point	Point	Point	Point	Point	Point	Point
Emission Rate (g/s)	1	1	1	1	1	1	1
Stack Height (ft)	13.5	13.5	13.5	13.5	13.5	13.5	13.5
Stack Height (m)	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Stack Inside Diameter (m)	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Air Flow Rate (scfm) ^{(1),(9),(11)}	2,020	1,813	1,962	1,885	1,899	2,003	
Air Flow Rate (acf m @ stack temp) ⁽²⁾	2,053	1,839	1,974	1,866	1,891	2,017	
Stack Gas Exit Temperature (K) ^{(1),(9),(10)}	299	299	296	291	293	296	
Ambient Air Temperature (K) ⁽³⁾	302	294	284	271	281	295	
Receptor Height (m) ⁽⁴⁾	1.5	1.5	1.5	1.5	1.5	1.5	
Urban/Rural	Urban	Urban	Urban	Urban	Urban	Urban	Urban
Building Height (m)	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Min Horizontal Bldg Dim (m)	7.9	7.9	7.9	7.9	7.9	7.9	7.9
Max Horizontal Bldg Dim (m)	9.8	9.8	9.8	9.8	9.8	9.8	9.8
Consider Bldg Downwash?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Simple/Complex Terrain Above Stack	Simple	Simple	Simple	Simple	Simple	Simple	Simple
Simple/Complex Terrain Above Stack Base	Simple	Simple	Simple	Simple	Simple	Simple	Simple
Meteorology	Full	Full	Full	Full	Full	Full	Full
Automated Distances Array	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Terrain Height Above Stack Base	0	0	0	0	0	0	0
SCREEN3 Model Output							
1-HR Max Concentration at Receptor Height ($\mu\text{g}/\text{m}^3$) ⁽⁵⁾	1,950	2,229	2,059	2,215	2,169	1,988	
Annualization Factor ⁽⁶⁾	0.08	0.08	0.08	0.08	0.08	0.08	
Average Annual Concentration at Receptor Height ($\mu\text{g}/\text{m}^3$) ⁽⁷⁾	156	178.3	164.7	177.2	173.5	159	
Distance To Max Concentration (m) ⁽⁸⁾	8	8	8	8	8	8	

See notes on last page.

Table D-1. Annual Summary of SCREEN3 Model Input and Outputs, Groundwater Interim Remedial Measure, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York.

Notes:

- (1) The stack air flow rate (in scfm) and temperature were measured using inline instrumentation. Values were measured at the blower effluent location.
- (2) The stack air flow rate at the stack temperature (in acfm) was calculated by dividing the stack air flow rate in scfm by the ratio of the standard temperature to the actual stack gas exit temperature in degrees Rankine.
- (3) The ambient temperature was recorded from the weather.newsday.com and/or weather underground (www.wunderground.com) websites for Islip, New York. The mean actual temperature from the website(s) was used in model calculation.
- (4) The receptor height corresponds to the average inhalation level.
- (5) SCREEN3 calculated constituent concentration at listed conditions at the specified inhalation level.
- (6) A USEPA time averaging conversion factor of 1/0.08 was used to convert the 1-hour maximum concentration output to an annual average.
- (7) Average annual constituent concentration at the receptor height was calculated by multiplying the one hour maximum concentration by the annualization factor.
- (8) SCREEN3 calculated distance to the 1-hour maximum concentration.
- (9) Stack Air Flow Rate and Exit Temperature parameter readings were recorded on October 3, 2012 at the time of October 3, 2012 air sample collection.
- (10) Mid-Train temperature was used for stack exit temperature as stack exit temperature was not recorded at the time of October 3, 2012 air sample collection.
- (11) Beginning with the January 2013 site visit the air flow rate in scfm is obtained from SCADA HMI.

Acronyms\Key:

µg/m ³	Micrograms per cubic meter.
acfm	Actual cubic feet per minute.
ft	Feet.
g/s	Grams per second.
K	Kelvin.
m	Meters.
scfm	Standard cubic feet per minute.
USEPA	United States Environmental Protection Agency.

Table D-2. Annual Summary of Maximum Allowable Stack Concentration Calculations, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.

Compound	Actual Effluent Concentrations ⁽¹⁾ ($\mu\text{g}/\text{m}^3$)					
	07/05/12	10/03/12	12/03/12	02/04/13	04/01/13	07/01/13
1,1,1 - Trichloroethane	0	0	0	0	0	0
1,1 - Dichloroethane	0.82	1.1	1.8	1.8	4.1	1.6
1,1 - Dichloroethene	0	0	1.0	3.3	5.3	0
Acetone	140	56	98	49	44	97
Chloroform	3	3.9	5.6	3.6	4.9	2.8
Ethylbenzene	0	0.84	0.96	0	1	0
Xylenes (o)	0	0.91	1.5	0.98	1.5	0
Xylenes (m,p)	0	1.9	2.8	1.6	2.9	0
Chloromethane	0	0	0.77	0	0	0
Tetrachloroethene	0	0	0	0	0	0
Trichloroethene	1.6	3.1	4.3	4.6	3.8	2
Vinyl Chloride	0	7.9	23	57	42	50
cis 1,2-Dichloroethene	1.9	9.6	25	46	43	25
trans 1,2 Dichloroethene	0	0	0	0	0	0
Benzene	0.96	0	1.9	1.1	2.3	1.7
Toluene	27	37	38	20	49	20
Trichlorofluoromethane (Freon 11)	0	1.9	3.0	2.3	1.9	0
Dichlorodifluoromethane (Freon 12)	2.9	3.1	3.5	2.6	2.8	2.7
Chlorodifluoromethane (Freon 22)	1,000	1,000	1,100	820	560	520

See notes on last page.

Table D-2. Annual Summary of Maximum Allowable Stack Concentration Calculations, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.

Compound	AGC ⁽²⁾ ($\mu\text{g}/\text{m}^3$)	Maximum Allowable Stack Concentration ⁽³⁾ ($\mu\text{g}/\text{m}^3$)					
		07/05/12	10/03/12	12/03/12	02/04/13	04/01/13	07/01/13
1,1,1 - Trichloroethane	5,000	3.31E+07	3.23E+07	3.26E+07	3.20E+07	3.23E+07	3.30E+07
1,1 - Dichloroethane	0.63	4.17E+03	4.07E+03	4.11E+03	4.04E+03	4.07E+03	4.16E+03
1,1 - Dichloroethene	70	4.63E+05	4.52E+05	4.56E+05	4.49E+05	4.52E+05	4.62E+05
Acetone	30,000	1.98E+08	1.94E+08	1.96E+08	1.92E+08	1.94E+08	1.98E+08
Chloroform	0.043	2.84E+02	2.78E+02	2.80E+02	2.76E+02	2.78E+02	2.84E+02
Ethylbenzene	1,000	6.62E+06	6.46E+06	6.52E+06	6.41E+06	6.46E+06	6.61E+06
Xylenes (o)	100	6.62E+05	6.46E+05	6.52E+05	6.41E+05	6.46E+05	6.61E+05
Xylenes (m,p)	100	6.62E+05	6.46E+05	6.52E+05	6.41E+05	6.46E+05	6.61E+05
Chloromethane	90	5.95E+05	5.82E+05	5.87E+05	5.77E+05	5.81E+05	5.95E+05
Tetrachloroethene	1	6.62E+03	6.46E+03	6.52E+03	6.41E+03	6.46E+03	6.61E+03
Trichloroethene	0.5	3.31E+03	3.23E+03	3.26E+03	3.20E+03	3.23E+03	3.30E+03
Vinyl Chloride	0.11	7.28E+02	7.11E+02	7.17E+02	7.05E+02	7.10E+02	7.27E+02
cis 1,2 Dichloroethene	63	4.17E+05	4.07E+05	4.11E+05	4.04E+05	4.07E+05	4.16E+05
trans 1,2 Dichloroethene	63	4.17E+05	4.07E+05	4.11E+05	4.04E+05	4.07E+05	4.16E+05
Benzene	0.13	8.60E+02	8.40E+02	8.47E+02	8.33E+02	8.40E+02	8.59E+02
Toluene	5,000	3.31E+07	3.23E+07	3.26E+07	3.20E+07	3.23E+07	3.30E+07
Trichlorofluoromethane (Freon 11)	5,000	3.31E+07	3.23E+07	3.26E+07	3.20E+07	3.23E+07	3.30E+07
Dichlorodifluoromethane (Freon 12)	12,000	7.94E+07	7.75E+07	7.82E+07	7.69E+07	7.75E+07	7.93E+07
Chlorodifluoromethane (Freon 22)	50,000	3.31E+08	3.23E+08	3.26E+08	3.20E+08	3.23E+08	3.30E+08

See notes on last page.

Table D-2. Annual Summary of Maximum Allowable Stack Concentration Calculations, Groundwater Interim Remedial Measure, Operable Unit 3
 (Former Grumman Settling Ponds), Bethpage, New York.

Compound	Percent of Maximum Allowable Stack Concentration ⁽⁴⁾					
	07/05/12	10/03/12	12/03/12	02/04/13	04/01/13	07/01/13
1,1,1 - Trichloroethane	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1,1 - Dichloroethane	0.02%	0.03%	0.04%	0.04%	0.10%	0.04%
1,1 - Dichloroethene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Acetone	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Chloroform	1.09%	1.40%	2.00%	1.31%	1.76%	0.99%
Ethylbenzene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Xylenes (o)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Xylenes (m,p)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Chloromethane	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Tetrachloroethene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Trichloroethene	0.05%	0.10%	0.13%	0.14%	0.12%	0.06%
Vinyl Chloride	0.00%	1.11%	3.21%	8.09%	5.91%	6.88%
cis 1,2 Dichloroethene	0.00%	0.00%	0.01%	0.01%	0.01%	0.01%
trans 1,2 Dichloroethene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Benzene	0.11%	0.00%	0.22%	0.13%	0.27%	0.20%
Toluene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Trichlorofluoromethane (Freon 11)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Dichlorodifluoromethane (Freon 12)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Chlorodifluoromethane (Freon 22)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Notes:

- (1) Actual effluent concentrations are analytical results from air samples collected on the dates shown. Data in this table corresponds to approximately the past year of system operation.
- (2) AGC refers to the compound-specific annual guideline concentration per the NYSDEC DAR-1 AGC/SGC tables, revised October 18, 2010.
- (3) Maximum allowable stack concentrations were calculated by dividing the product of the annual guideline concentration of a compound and the ratio of the SCREEN3 gas emission rate and the SCREEN3 average concentration at receptor height by the air flow rate at the stack temperature and multiplying by the appropriate conversion factors.
- (4) Percent of MASC was calculated by dividing the actual effluent concentration by the MASC for a given monitoring event.

Acronyms\Key:

µg/m ³	Micrograms per cubic meter.
AGC	Annual guideline concentration.
MASC	Maximum allowable stack concentration.